WAT-1000

USER MANUAL

Rev. 1.00

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Watec Co., Ltd

0. Change History

Rev. No.	Date	Changes	Remarks
1.00	2008.09.16	-	First edition

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1. Introduction

- The WAT-1000 user manual describes the functions and the adjustment method using the On Screen Display (OSD)
- When the settings of the WAT-1000 is changed according to the WAT-1000 user manual, check to see that the operation and the effects of the changes made to the camera are acceptable.
- The WAT-1000 user manual is subject to change by design and the specifications of the product without notice.
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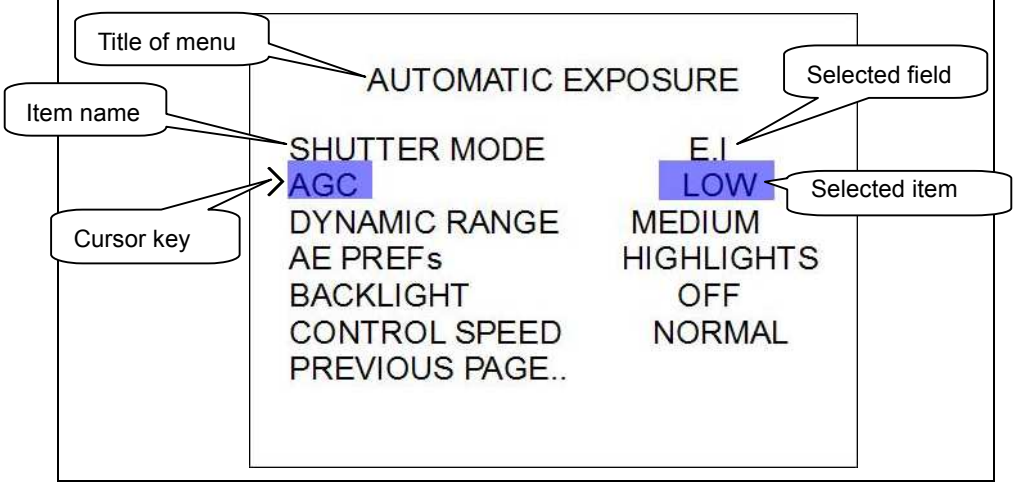
2. Example of screen menu configuration and basic operation

2.1 Screen menu configuration example

The basic screen menu configuration is as follows.

Fig. 1 Screen menu configuration 1



Title of menu

The title of the menu page for AUTOMATIC EXPOSURE

Item name

・Selectable items are shown on the indicated page.

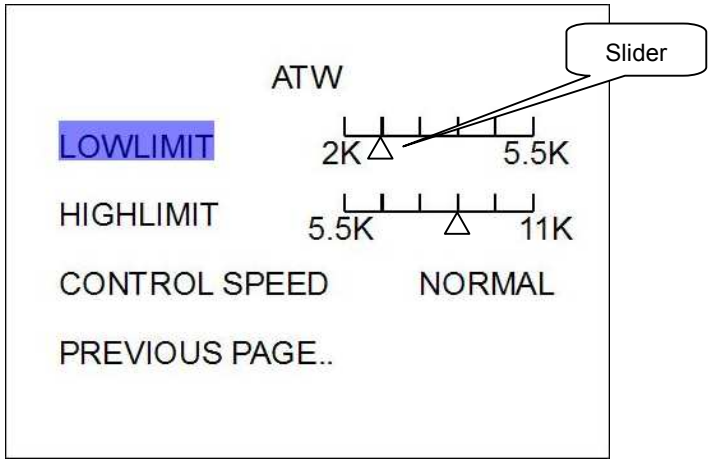
・The cursor position is highlighted in gray.

・When ”..” is added to the end of an item name, it means it is continued on to the next page.

List of item

The indicated item next to item name is the current setting.

Fig. 2 Menu screen configuration 2



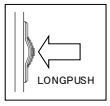
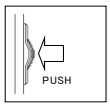
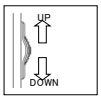
Slider

The slider is used to set the required value of an item.

Increase or decrease the parameter value using the slider

2.2 Jog dial basic operation

Chart 1. Jog dial basic operation

Operation and Name		Result
	Push the center of the jog-dial for a few seconds	ON / OFF for menu screen
	Push the center	Select / Exit
	Roll up	Cursor or item UP
	Roll down	Cursor or item DOWN

Camera ID

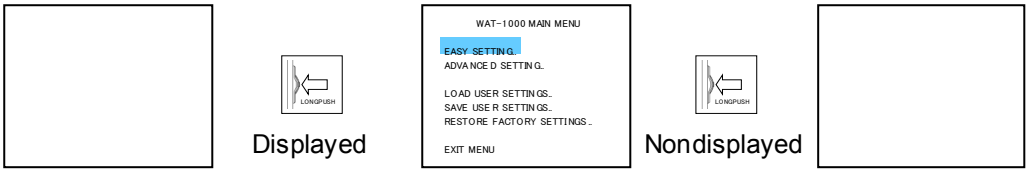
See the “CAMERA ID SETTING” section for the operation method of the CAMERA ID

Zone setting

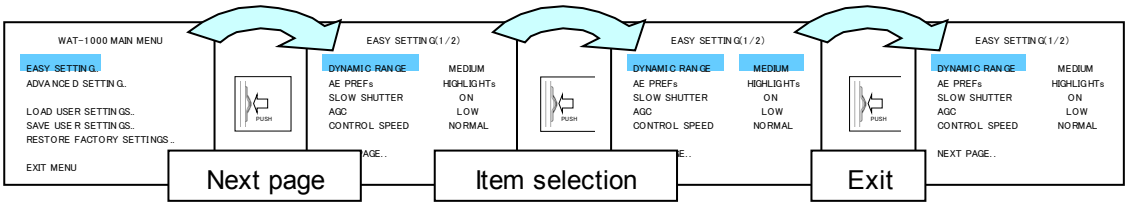
See the “ACTIVITY DETECTION SETTING” section for the ACTIVITY DET. ZONE operation method.

2.3 Example of the operation menu

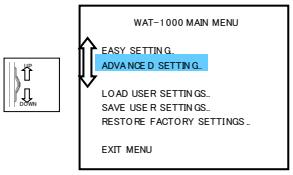
How to Displayed/Nondisplayed the MENU



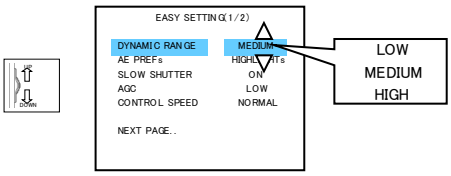
How to Select/Cancel



How to move the cursor up and down



How to item change



3. Functions and Adjustment method

3.1. Automatic Exposure

3.1.1. Wide dynamic range

“Dynamic range” is to describe the intensity ratio between maximum and minimum illumination in an image. Standard cameras have narrow dynamic range; therefore, white out and/or silhouetting phenomenon occurs when a subject contains any objects with excessive difference in illumination intensity, for example, backlight circumstances. The WAT-1000 is able to provide a natural image to the human eye by greatly reducing white out and silhouetting occurring.

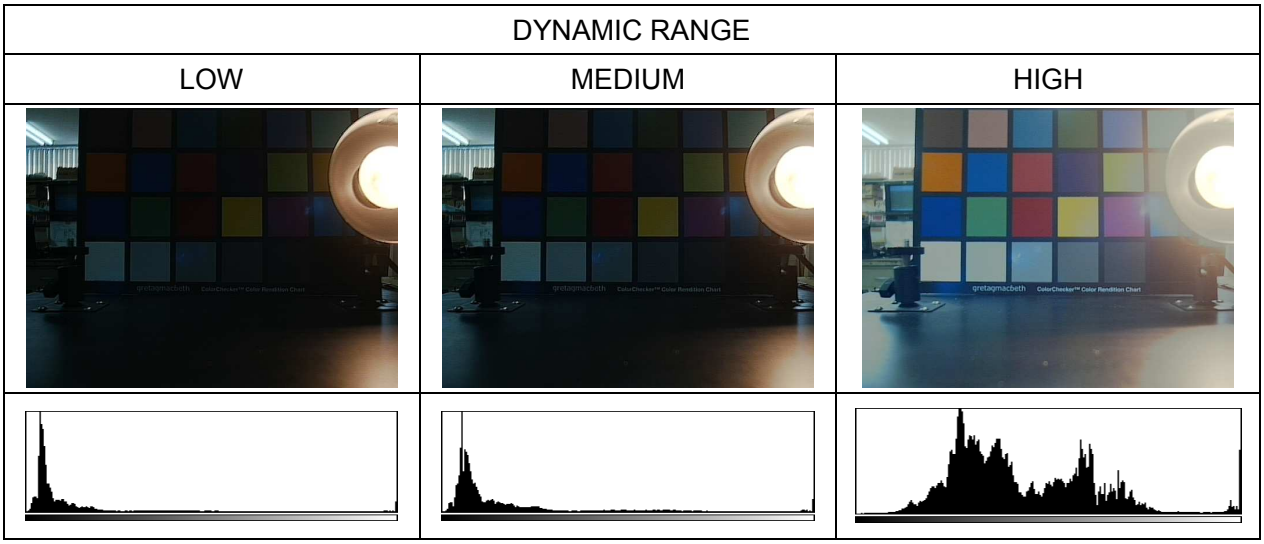
The wider the dynamic range, the more the camera is able to cope with high contrast situations and present a clear picture of the contrasting areas; however, if the dynamic range is too wide, a blur image with low contrast will be evident. The WAT-1000 prevents contrast degradation by automatically controlling its dynamic range according to the illuminance ratio of a subject. In addition, the maximum value of the WAT-1000 dynamic range can be fixed on the OSD menu, “DYNAMIC RANGE”.

To take an image with excessively varied intensity of illiminations and the desire to have a clear picture in both bright and dark areas at the same time, select “HI” on the DYNAMIC RANGE setting. Meanwhile, to take an image with less varied intensity of illumination or paying attention to either the bright area or the dark area, select “MEDIUM” or “LOW”. The default setting is MEDIUM.

Chart 2. Dynamic range setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
DYNAMIC RANGE	LOW	=Standard camera	○	○
	MEDIUM	Typical	○	○
	HIGH	Max	○	○

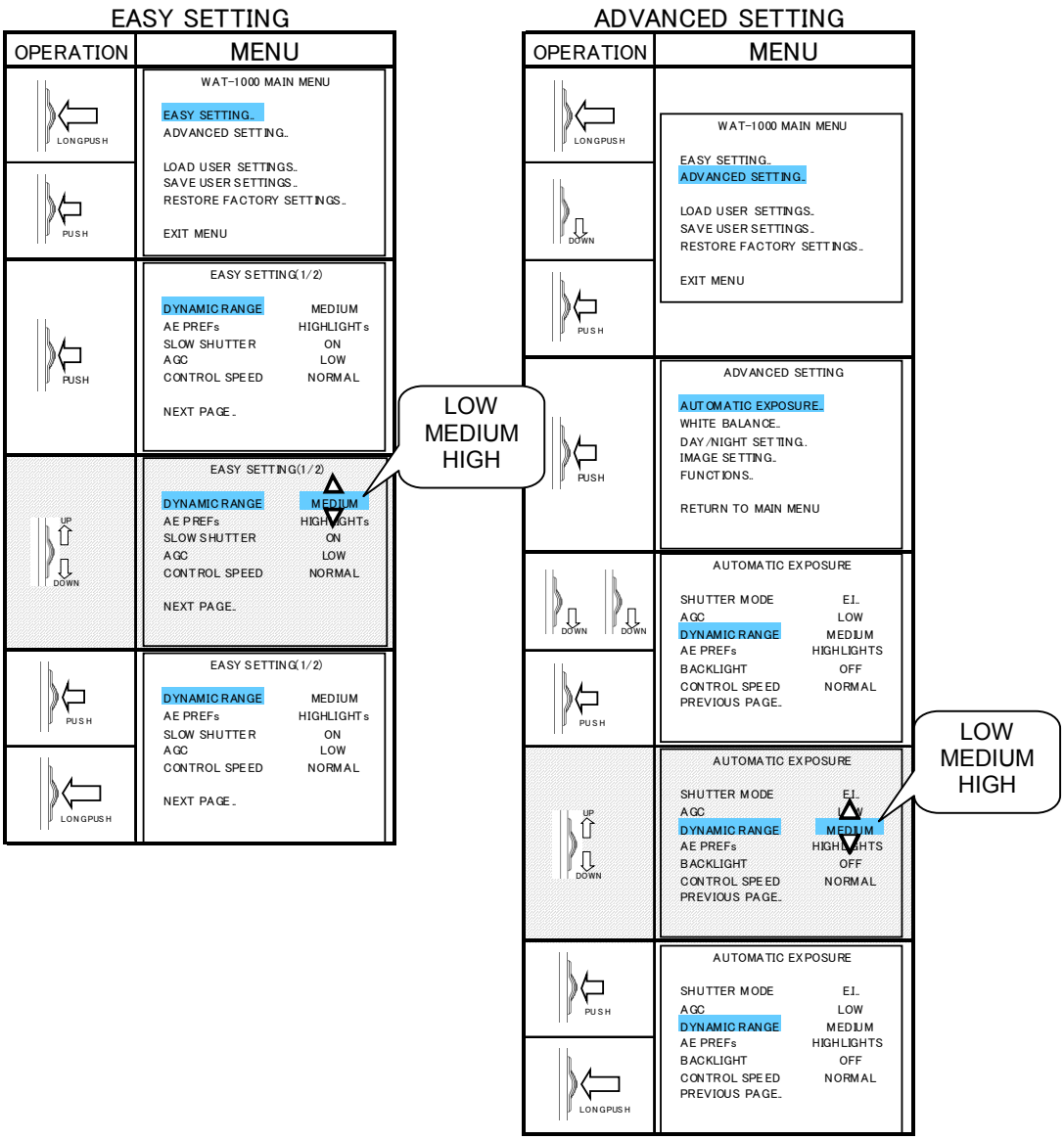
Fig. 3 Example of Dynamic Range Configuration



AE PREFs: HIGHLIGHTS

- The setting of the dynamic range is only available when the shutter mode is set to E.I.
- When using the slow shutter mode (ESS), the wide dynamic range will not be available.
- As for information and setting of the shutter mode, see “section 3.1.2. (p.11)”

[Operating procedure]



3.1.2. Electronic shutter

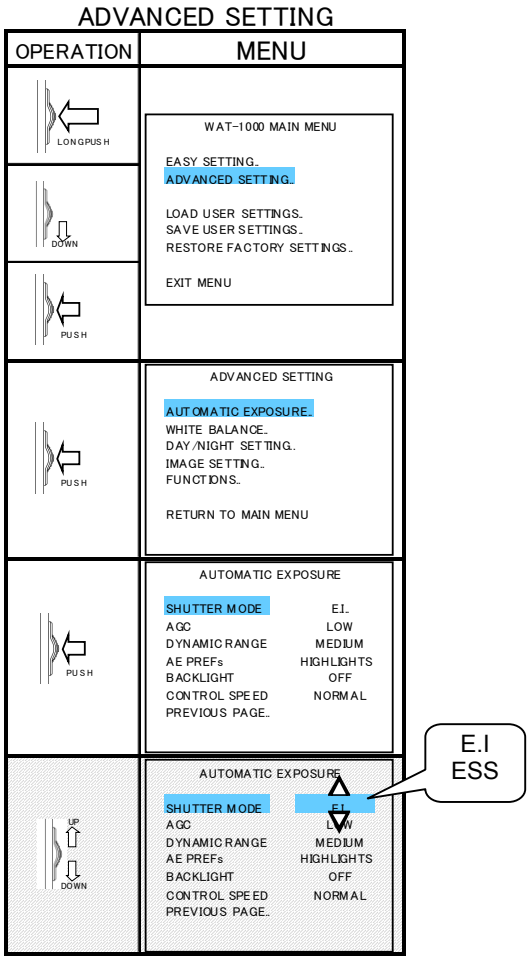
The WAT-1000 has an electronic shutter function with changeable exposure times. There are two kinds of shutter mode, electronic iris mode(E.I) and slow shutter mode(ESS). The electronic iris mode automatically controls the shutter speed according to the illumination of the object. Each pixel adjusts itself individually to give the best available picture regarding light and dark in a single image. (This is the wide dynamic range mode).

In the slow shutter mode, all the pixels adjust to the slow shutter speed regardless of the lighting condition of the object. When an auto iris lens is used, the aperture of the lens is fully opened regardless of the lighting condition of the object. Because the electronic shutter speed is not controlled independently for each pixel, the wide dynamic range will not be available. The slow shutter mode can be used only when an object is very dark, and a stable lighting condition is present. The default setting is set to E.I.

Chart 3. Shutter mode setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
SHUTTER MODE	E.I	Electronic shutter	○	×
	ESS	Slow shutter	○	×

[Operating procedure]



When the Electronic iris mode (E.I) is selected in the shutter mode setting section, the following settings can be also set.

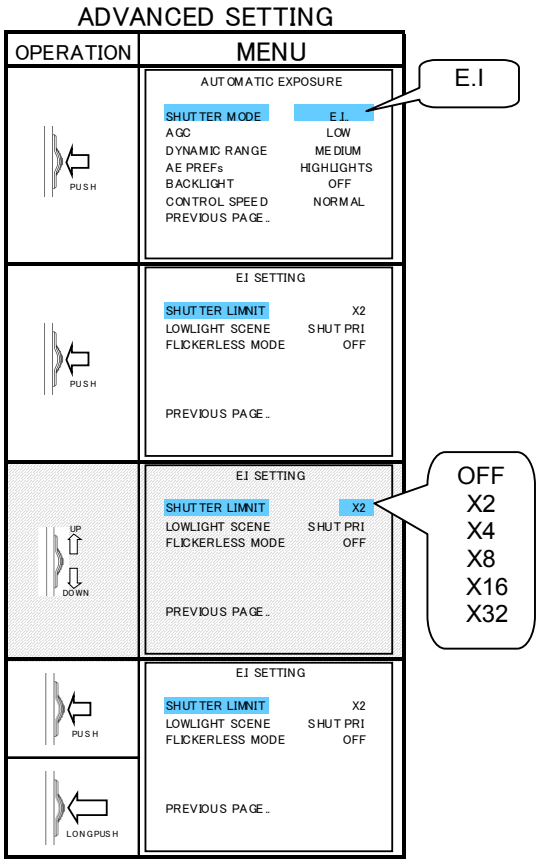
Shutter limit (Slow shutter in EASY SETTING)

This function is set to the minimum value of the electronic shutter speed control range with electronic iris control. When the shutter limit is set to OFF, the minimum value of the shutter speed is 1/60s. Noise will occur with dark objects, but the resolution of a moving object will be preserved.
If the setting value of the shutter limit is selected other than OFF, the selected slow shutter mode will be available when an object gets dark. If a slower shutter mode is required, shift the shutter limit value from X2 to X32. The resolution of a moving object may be lower, but the object under dark lighting condition can be clearly monitored. As long as the slow shutter mode is activated, wide dynamic range mode will not be available. The default setting is set to X2.

Chart 4. Shutter limit setting list

SETTING VALUE		DESCRIPTION		ADVANCED	EASY
		NTSC	PAL		
SHUTTER LIMIT [SLOW SHUTTER]	OFF	Min.: 1/60s	Min.: 1/50s	○	○
	X2	Min.: 1/30s	Min.: 1/25s	○	○
	X4	Min.: 1/15s	Min.: 1/12.5s	○	×
	X8	Min.: 1/7.5s	Min.: 1/6.25s	○	×
	X16	Min.: 1/3.75s	Min.: 1/3.125s	○	×
	X32	Min.: 1/1.875s	Min.: 1/1.5625s	○	×

[Operation procedure]



Lowlight scene

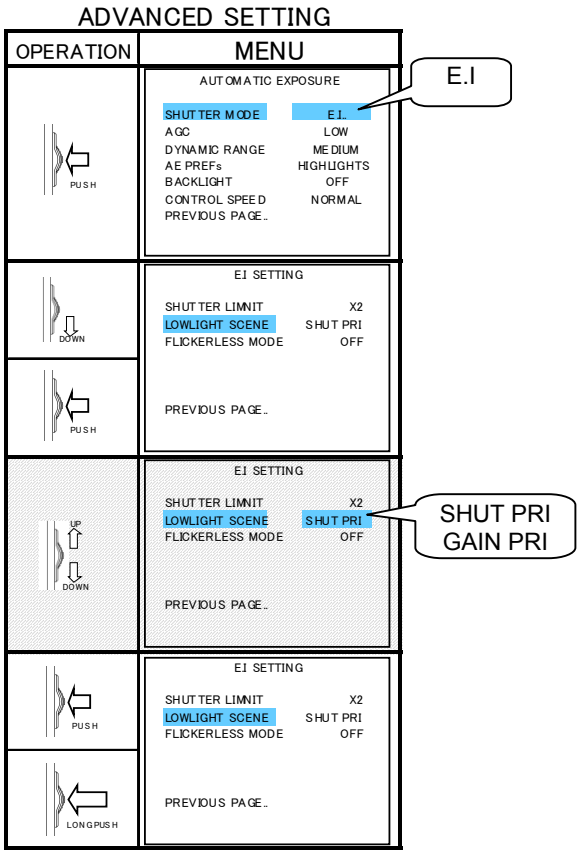
This function is used to set the operation order mode, which will operate by priority in slow shutter mode, when the SHUTTER LIMIT mode is set to any other than OFF

If SHUT PRI is selected, slow shutter mode operates first, and then gain up mode operates. The resolution of a moving object will become decreased, but noise will be inconspicuous.
If GAIN PRI is selected, gain up mode operates first, and then the slow shutter mode operates. Noise will be present compared with the SHUT PRI mode, but doesn't decrease the resolution of a moving object. The default setting is set to SHUT PRI.

Chart 5. Lowlight scene setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
LOWLIGHT SCENE	SHUT PRI	Slow shutter priority	○	×
	GAIN PRI	Gain up priority	○	×

[Operation procedure]



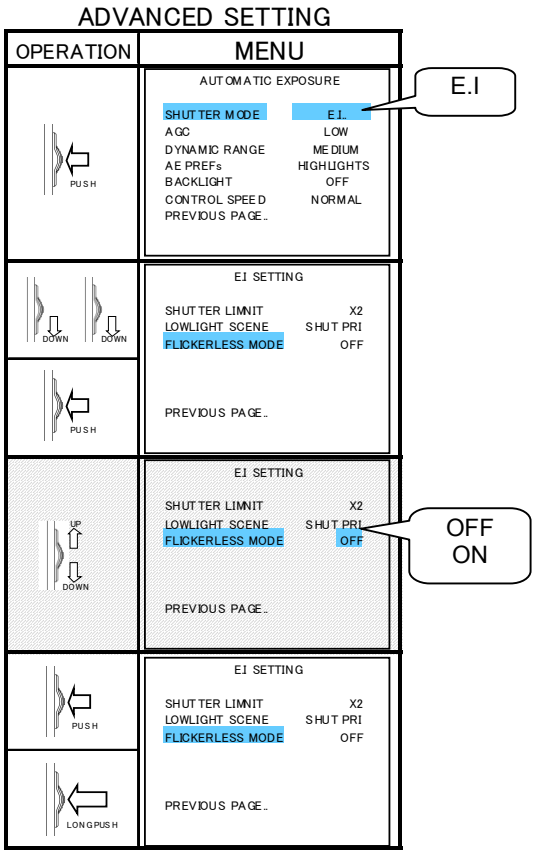
Flickerless mode

This function reduces the flicker occurring on the screen when an NTSC system camera is used under fluorescent lighting conditions at 50Hz power supply frequency. When flickerless mode is set to ON, flicker mitigation mode becomes available. Flickerless mode is only available with NTSC mode. This mode is not selectable with PAL. The default setting is OFF.

Chart 6. Flickerless mode setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
FLICKER LESS MODE	OFF	Flicker mitigation OFF	○	○
	ON	Flicker mitigation ON	○	○

[Operation procedure]



When slow shutter (ESS) is selected in the shutter mode setting section, the following settings can also be set if required

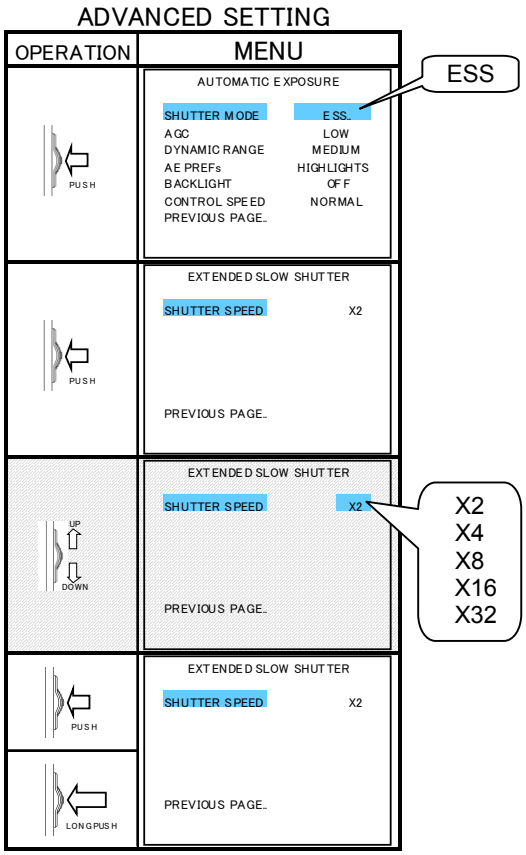
Shutter speed

This is the function that selects the exposure time for a slow shutter speed. The default setting is X2.

Chart 7. Slow shutter mode setting list

SETTING VALUE		DESCRIPTION		ADVANCED	EASY
		NTSC	PAL		
SHUTTER SPEED	X2	1/30s	1/25s	○	×
	X4	1/15s	1/12.5s	○	×
	X8	1/7.5s	1/6.25s	○	×
	X16	1/3.75s	1/3.125s	○	×
	X32	1/1.875s	1/1.5625s	○	×

[Operation procedure]



3.1.3. Auto gain control (AGC)

This is a function that sets the maximum value of the auto gain control.
When the manual gain value is enlarged, the sensitivity will increase and also noise will increase.
MANUAL mode is only available when stable lighting conditions around the object is obtained.
The dynamic range of the dark area might be decreased depending on the object.
LOW/MEDIUM/HIGH mode is recommended for normal use. The default setting is LOW.

Chart 8. Auto gain control setting list

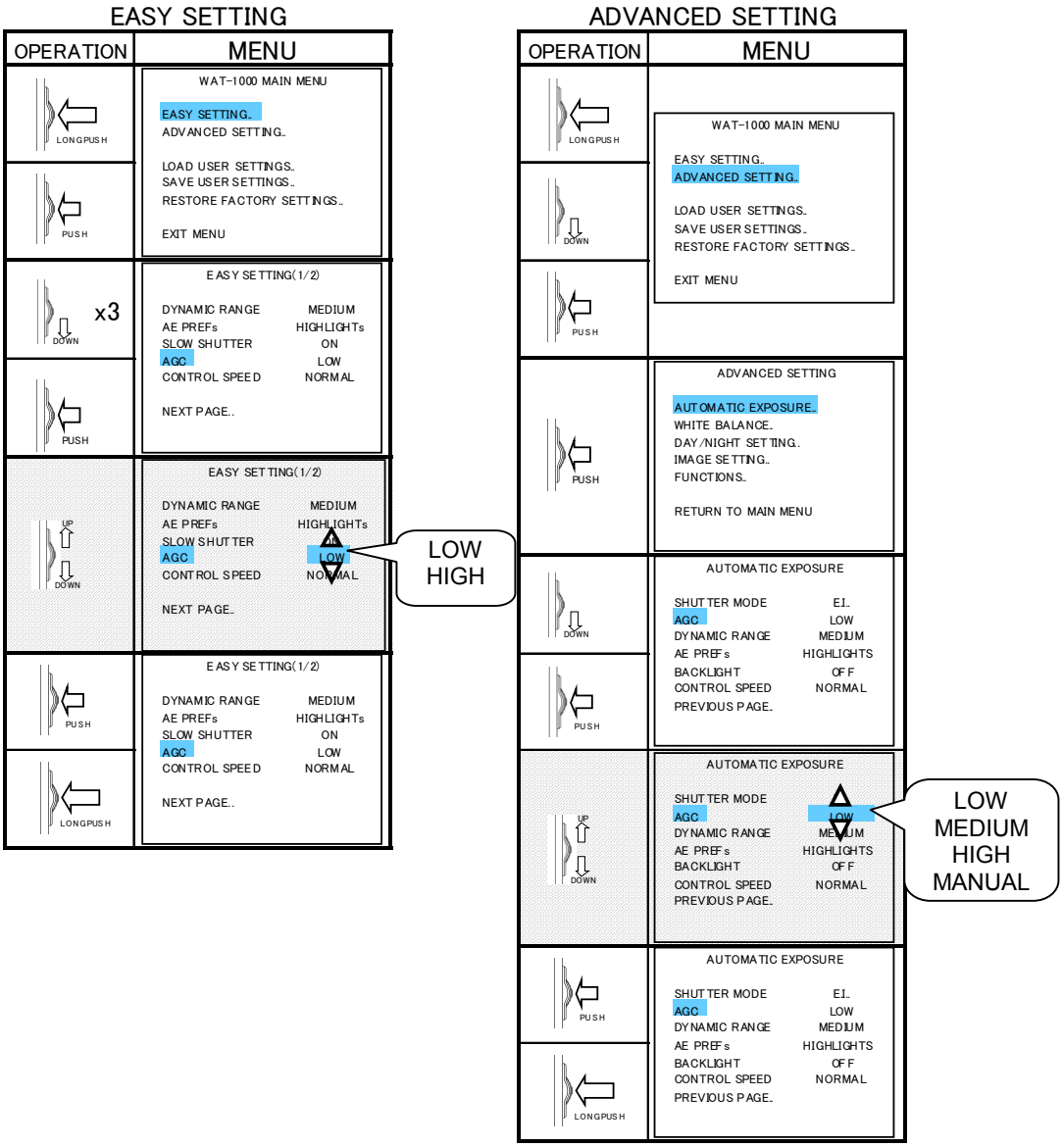
SETTING VALUE		DESCRIPTION	ADVANCED	EASY
AGC	LOW	0~22dB (Automatic control)	○	○
	MEDIUM	0~32dB (Automatic control)	○	×
	HIGH	0~40dB (Automatic control)	○	○
	MANUAL	Fixed gain	○	×

Chart 9. Fixed gain setting in MANUAL mode

SETTING VALUE	DESCRIPTION	ADVANCED	EASY
GAIN	0~40dB (1dB STEP)	○	×

⚠ When auto gain control is set to MANUAL, AUTO mode cannot be selected with the DAY/NIGHT control section

[Operation procedure]



3.1.4. Contrast preference setting for exposure control

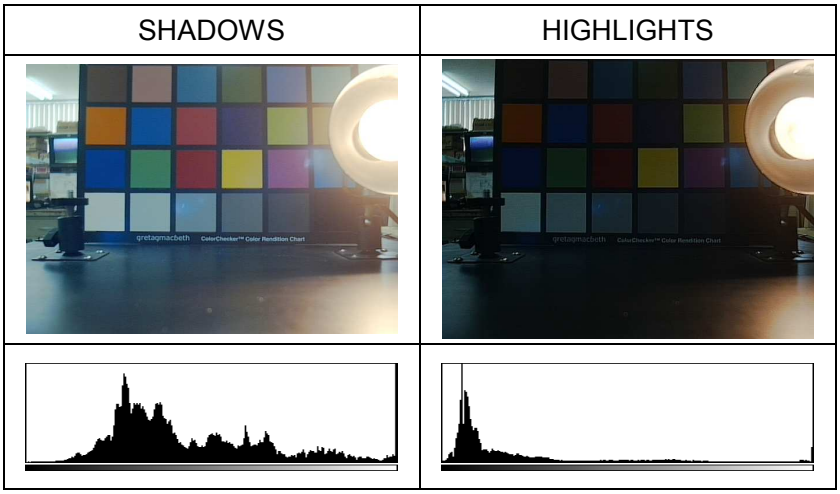
This is a function that selects the reference setting for the auto exposure control (AE) and dynamic range control.

Set to SHADOWS when the dark part of an object is needed to be monitored. When the bright part of an object is to be monitored, set to HIGHLIGHT. The default setting is HIGHLIGHT.

Chart 10. AE PREFs setting list

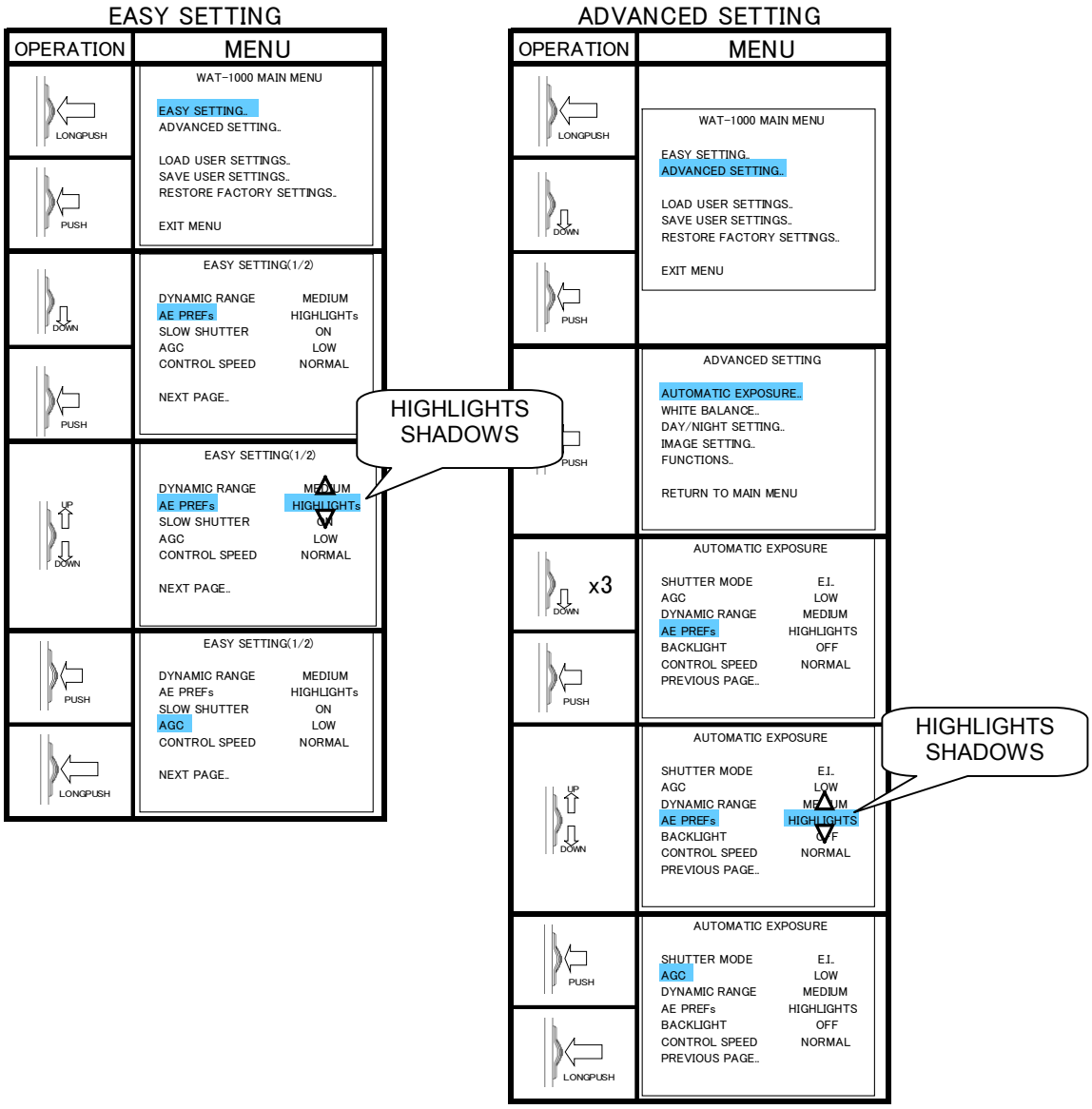
SETTING VALUE		DESCRIPTION	ADVANCED	EASY
AE PREFs	SHADOWS	Dark part preference	○	○
	HIGHLIGHTS	Bright part preference	○	○

Fig. 4



DYNAMIC RANGE set to MEDIUM

[Operation procedure]



3.1.5. Control speed

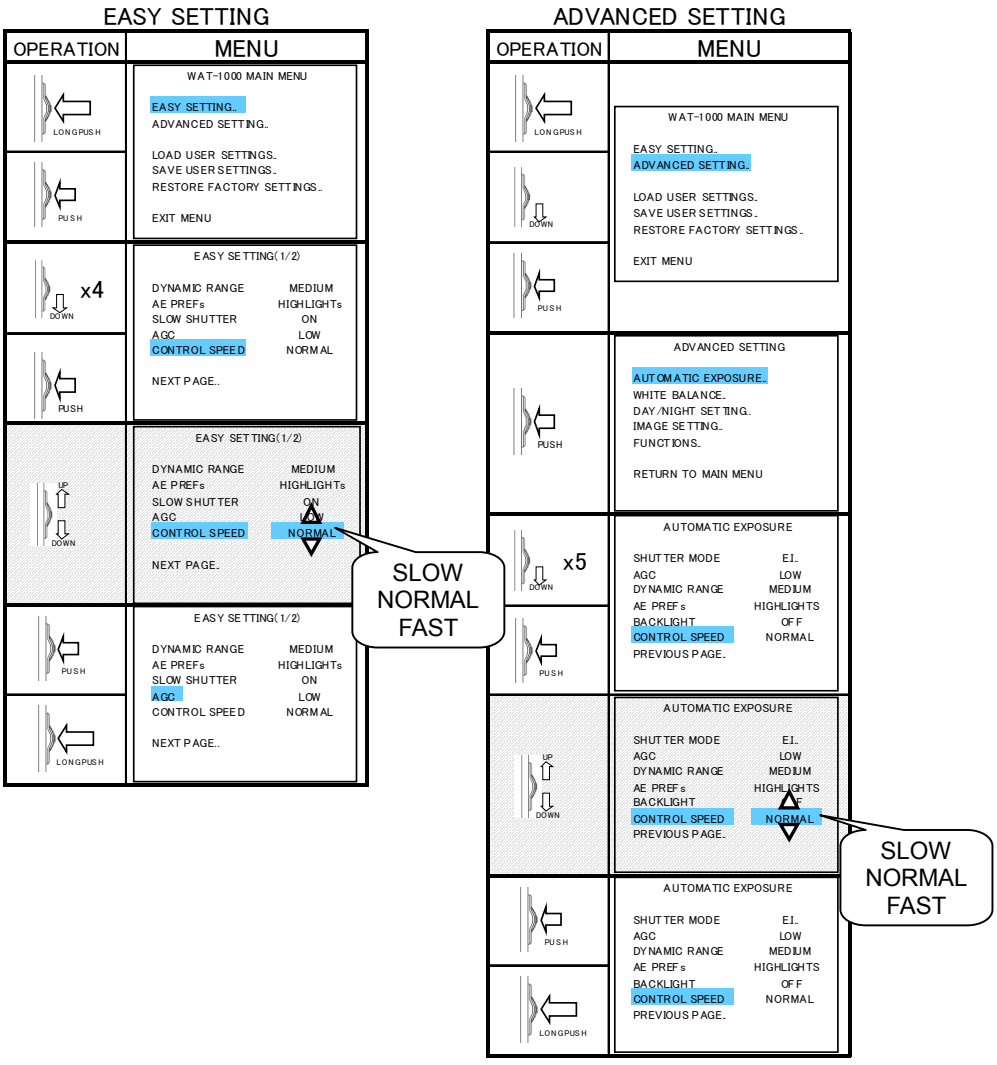
This is the function that sets the control speed of the AE control and white balance control.
The control speed setting of both the AE control and the white balance control can be set in the CONTROL SPEED at EASY SETTING section. As for the ADVANCED SETTING section, the control speed of the AE control is set by AUTOMATIC EXPOSURE, and the control speed of the white balance control is set by WHITE BALANCE. Therefore, if detailed settings of each control speed independently are needed, set them using the ADVANCED SETTING section.

When the control speed is set to SLOW, the monitored image becomes slow to react to the environment, and it takes time for the adjustment. However, the changing process becomes smooth due to small control steps.
When set to NORMAL, the control speed and the control steps become normal.
When set to FAST, the control speed becomes fast, and the time adjustment becomes short.
The default setting is NORMAL. Refer to ATW for a more detailed explanation.

Chart 11. Control speed setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
CONTROL SPEED (AE / ATW)	SLOW	Low speed control	○	×
	NORMAL	Normal	○	×
	FAST	High speed control	○	×
CONTROL SPEED (AE & ATW)	SLOW	Low speed control	×	○
	NORMAL	Normal	×	○
	FAST	High speed control	×	○

[Operation procedure]



3.2. White balance

The white balance is a function to correct color temperature of a white object under various lighting environments.

ATW mode automatically follows and adjusts to the changing color temperature of the illumination. This mode is effective when the lighting environment changes.

In PWB mode, the correction value of the white balance of the camera is calculated by using white paper and the achromatic color object to fix the correct color balance.

MANUAL mode is set to the correction value of the white balance by the slider as required.

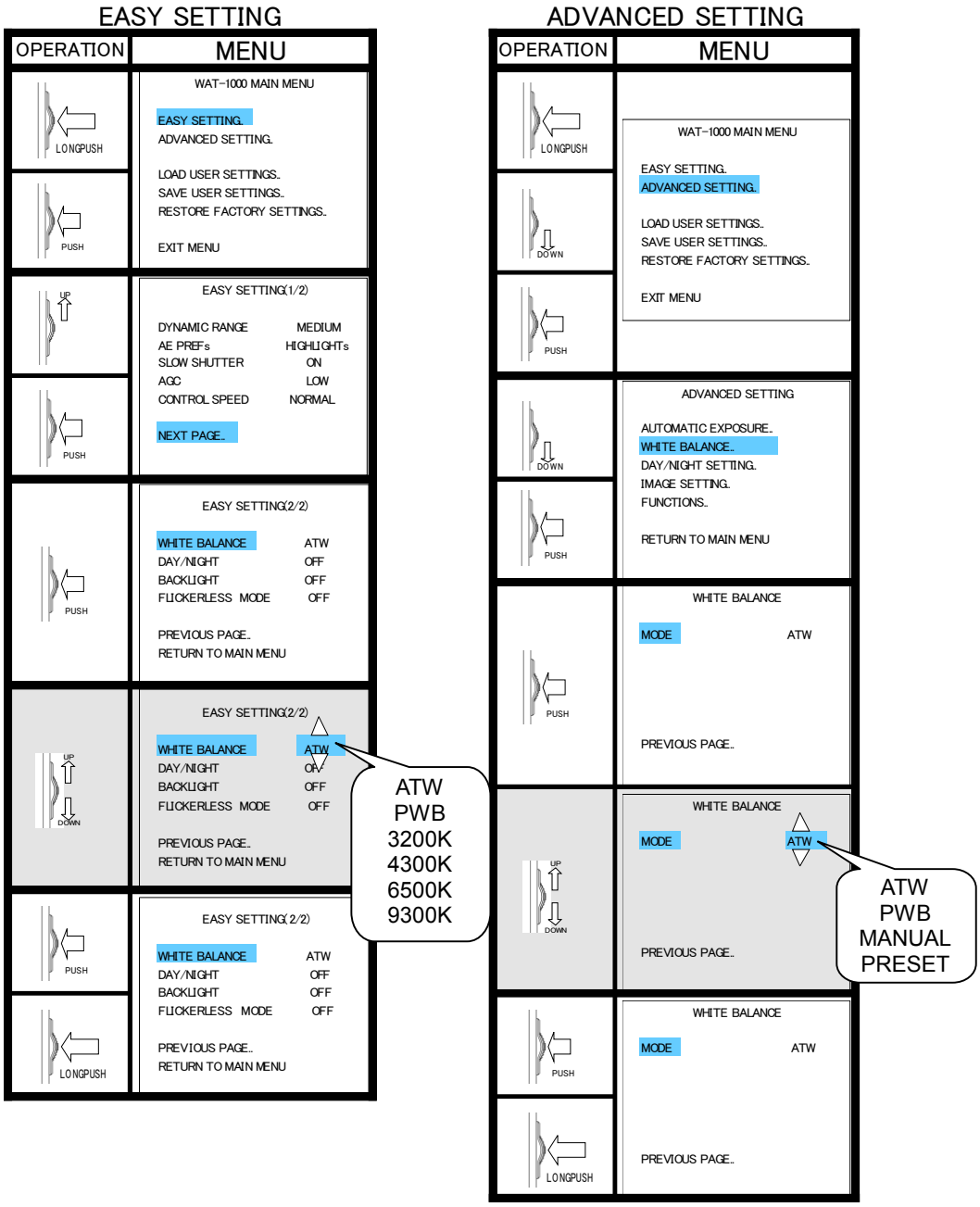
PRESET mode: There are four kinds of white balance modes in PRESET, select the required color temperature from 3200K, 4300K, 6500K and 9300K.

The default setting is ATW.

Chart 12. White balance setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
MODE	ATW	Automatically follows and adjusts to the changing color temperature of the illumination	○	○
	PWB	The correction value of the white balance is calculated.	○	○
	MANUAL	Manually adjust for the correction value of the white balance.	○	○
	PRESET	Select the color temperature in the Preset	○	○

[Operation procedure]



The ATW has the following additional settings.

LOWLIGHT is a parameter that is set to the minimum value of the control range when controlling the color temperature using ATW.

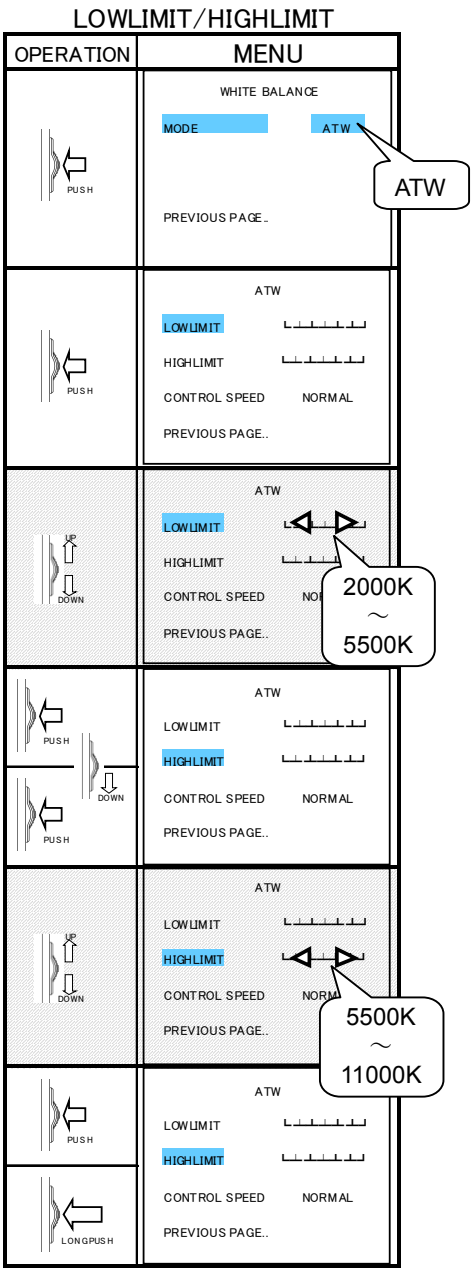
HIGHLIGHT is a parameter that is set to the maximum value of the control range when controlling the color temperature using ATW.

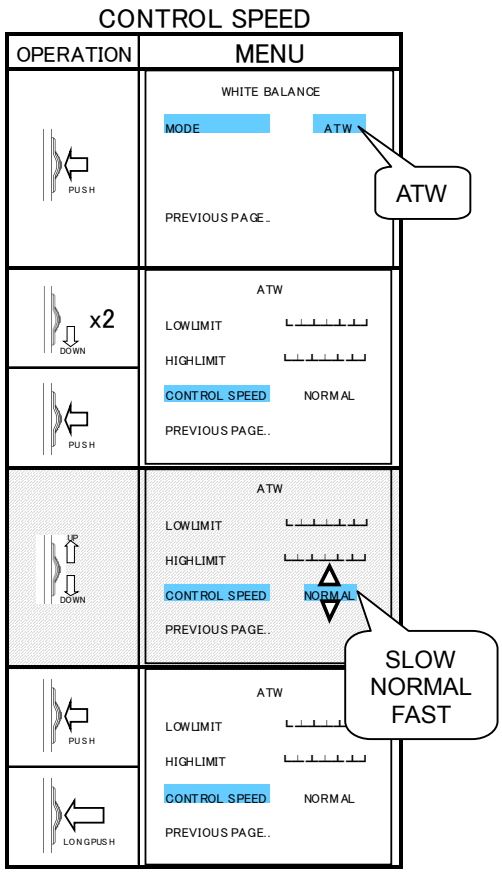
The CONTROL SPEED is a parameter setting the ATW adjustment speed.
There are three settings, slow, normal and fast. With slow and Normal settings, the adjustment changes smoothly. In fast mode, the speed of the adjustment is fast, but it will not be as smooth as normal and slow. The adjustment will be in short steps.

Chart 13. ATW setting list

SETTING		DESCRIPTION	ADVANCED	EASY
LOWLIMIT	2000K ～ 5500K	The setting for the minimum correction value of the correction range of the ATW	○	×
HIGHLIMIT	5500K ～ 11000K	The setting for the maximum correction value of the correction range of the ATW	○	×
CONTROL SPEED	SLOW	The control speed of the ATW set to slow	○	×
	NORMAL	The control speed of the ATW set to normal	○	×
	FAST	The control speed of the ATW set to fast	○	×

[Operation procedure]





MANUAL mode has the following additional settings.

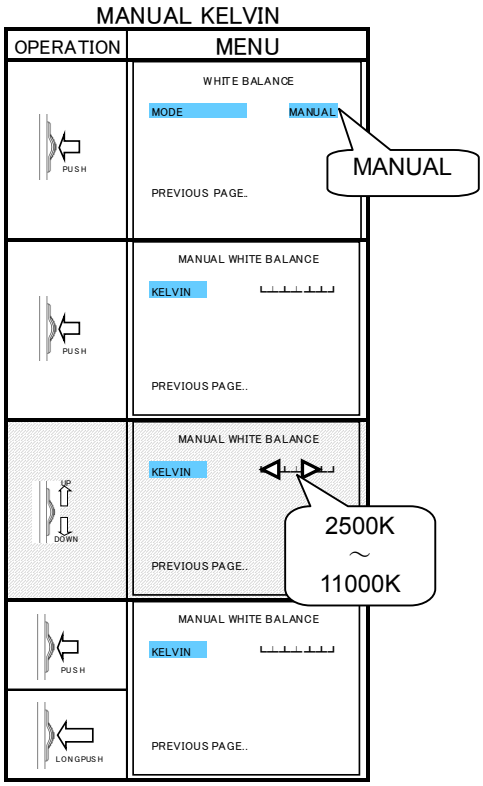
KELVIN sets the required correction value of the white balance using the slider

The range of color temperature can be set from 2500K to 11000K

Chart 14. Manual white balance setting list

SETTING		DESCRIPTION	ADVANCED	EASY
KELVIN	2.5K～11K	Manually adjusts the correction value of the white balance	○	×

[Operation procedure]



PRESET mode has the following additional settings.

3200K: This white balance correction value is suitable when using incandescent lighting and halogen bulbs.

4300K: This white balance correction value is suitable when using fluorescent lighting (white color: W).

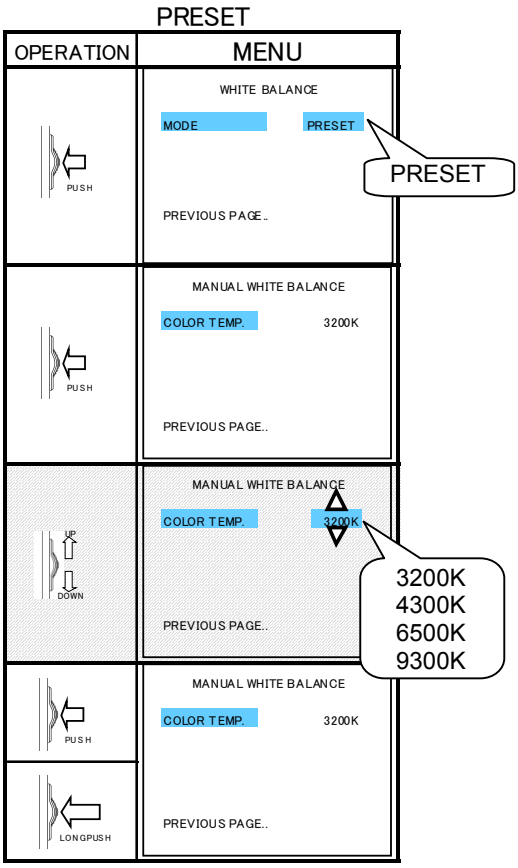
5600K: This white balance correction value is suitable when using fluorescent lighting (daylight color: D).

9300K: This white balance correction value is suitable when using LED etc. with high color temperature.

Chart 15. Preset setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
COLOR TEMP.	3200K	When using incandescent lighting	○	○
	4300K	When using fluorescent lighting (white color: W)	○	○
	6500K	When using fluorescent lighting (daylight color: D)	○	○
	9300K	When using LED etc. with high color temperature	○	○

[Operation procedure]



3.3. DAY/NIGHT Setting

The image sensor, which is used by the WAT-1000 has a sensitivity for near infrared. Usually, the near-infrared rays are not visible to the human eye. Therefore, it needs to block the infrared light entering the image sensor to perform the color reproduction according to the human eye by the color camera. The infrared cut filter is effective for the above purpose. The infrared cut filer operates effectively when adequate lighting is obtained for the object. However, when the object becomes dark, the infrared cut filter cannot operate effectively since the incident light is not enough for the near-infrared light to be cut.

In the WAT-1000, this function can switch over to the Day mode (color mode with infrared filter) and Night mode (monochrome mode without infrared filter) by the infrared cut filter switching unit.

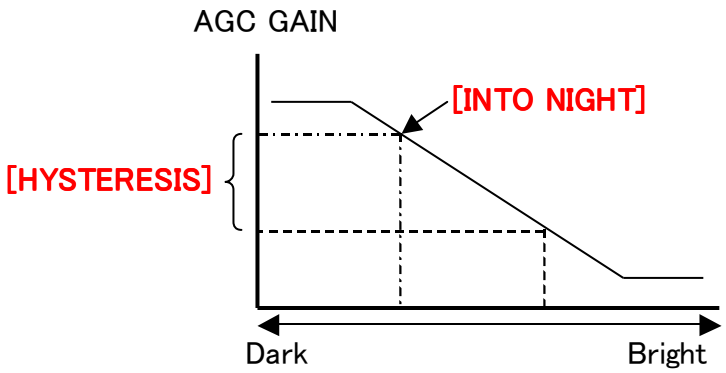
There are four selectable modes as shown below. The default setting is DAY(OFF).

Chart 16. D/N CONTROL setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
D/N CONTROL (DAY/NIGHT)	AUTO	Mode changing according to the lighting condition	○	○
	DAY (OFF)	Day mode / Color	○	○
	NIGHT	Night mode / Monochrome	○	×
	EXT	Mode changing from external signal	○	×

(): EASY SETTING

In AUTO mode, DAY/NIGHT mode is automatically changed according to the illumination of the object. For the determination of brightness, it uses the gain value of the auto gain control.
Under the DAY mode condition, when the object becomes dark, and the gain value of the AGC exceeds the set value, the camera mode becomes NIGHT mode automatically. On the other hand, when the object becomes bright, and the gain value of AGC becomes less than the set value, DAY mode is automatically selected. At this time, when the preset value of both the AGC gain is the same, “hunting” may occur. For the WAT-1000, to prevent hunting, the adjustment difference of the AGC gain uses the parameters [INTO NIGHT] and [HYSTERESIS].
The INTO NIGHT mode sets the switching level from the day mode to the night mode. It becomes night mode when the AGC gain of the camera exceeds the setting value of the INTO NIGHT mode. In HYSTERESIS, the switch level from day mode to night mode is set by the difference of the INTO NIGHT mode. The default setting is 19dB for INTO NIGHT and 6dB for HYSTERESIS.



■Adjustment method

The adjustment procedure of INTO NIGHT and HYSTERESIS are as follows.

① Set the INTO NIGHT to 19dB and set the HYSTERESIS to 6dB.

② Adjust the aperture of the lens and/or the illumination while watching the monitor to duplicate the light level of the night mode.

③ Until switching to night mode, keep increasing the level of the INTO NIGHT mode slowly.

④ If hunting does not occur, go on to step ⑥

⑤ When hunting is generated, keep rising the value of HYSTERESIS step by step until the hunting stops. If hunting does not stop with the maximum value of the HYSTERESIS mode, AUTO mode may not be available. Therefore, please change the object or the illumination, or use EXT mode.

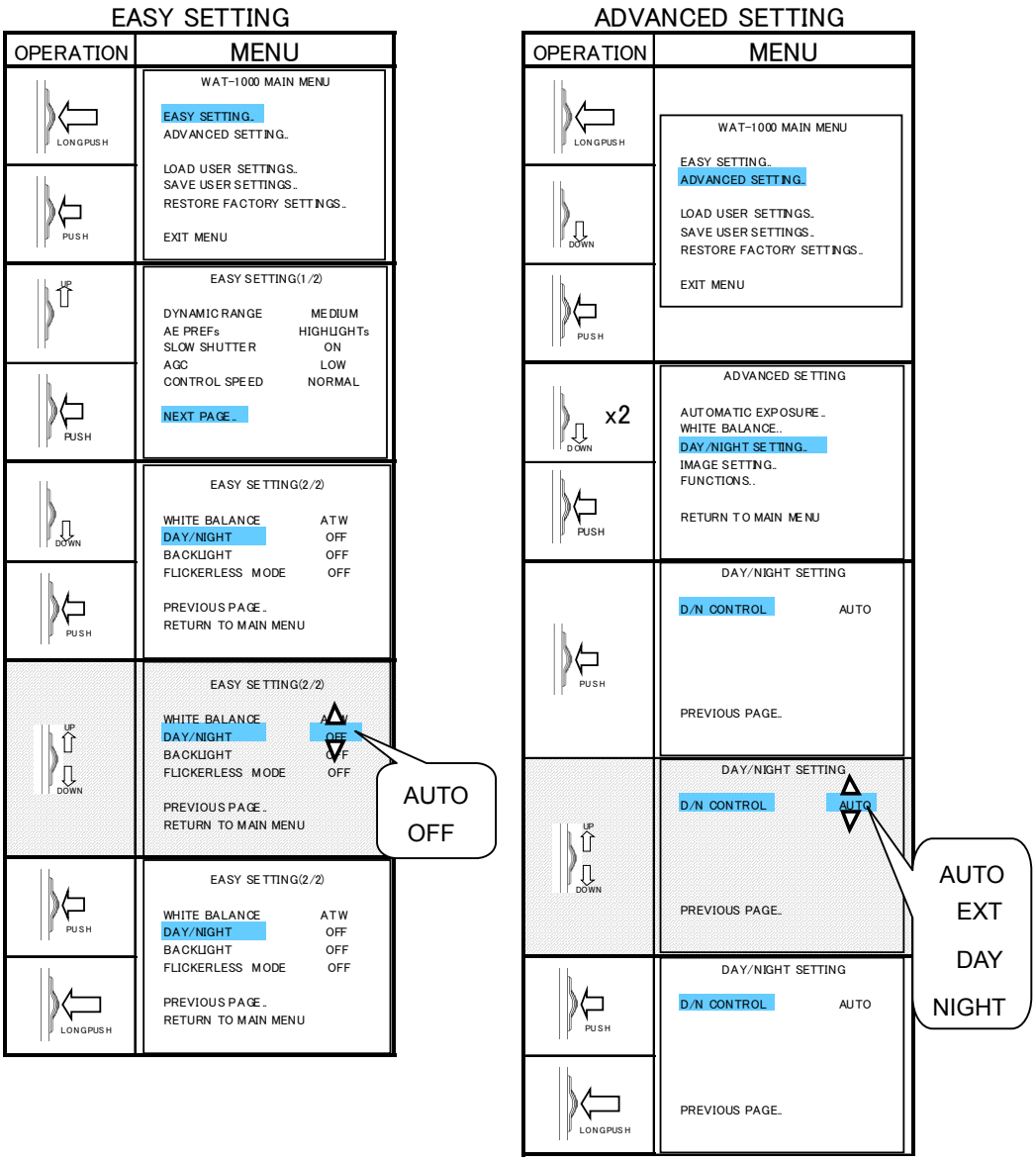
⑥ Confirm the switching of Day/Night mode operates properly without any problems by adjusting the aperture of a lens and/or the illumination. Save the above mentioned setting by "Save user setting" if there is no problem.

⑦ The set value of HYSTERESIS may be too large if it is not switching into the DAY mode. Please readjust from ①. If it still does not switch normally, use another object or change the illumination condition, or use EXT mode

Chart 17. AUTO mode setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
INTO NIGHT	1 ~ (AGC MAX-1)	The switch level to monochrome from color	○	×
HYSTERESIS	1 ~ (INTO NIGHT-1)	The blind sector of the switching level	○	×

[Operation procedure]



INPUT DURATION is set to 1 second before the camera switches over to NIGHT MODE. This one-second delay means that in an environment with changing light the camera doesn't switch over to NIGHT MODE by mistake. The default setting is one second, but can be changed to suite your needs.

HOLD TIME, sets a period to stop the switching behavior after the DAY/NIGHT mode is switched. This mode prevents switching back again accidentally until the exposure control becomes stable after the infrared cut filter has been switched. The default setting is 800ms.

Fig. 5

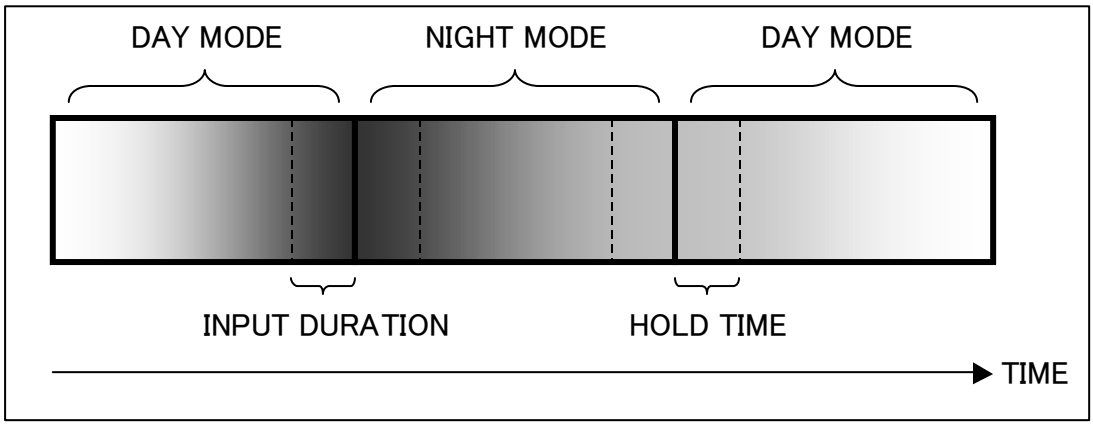
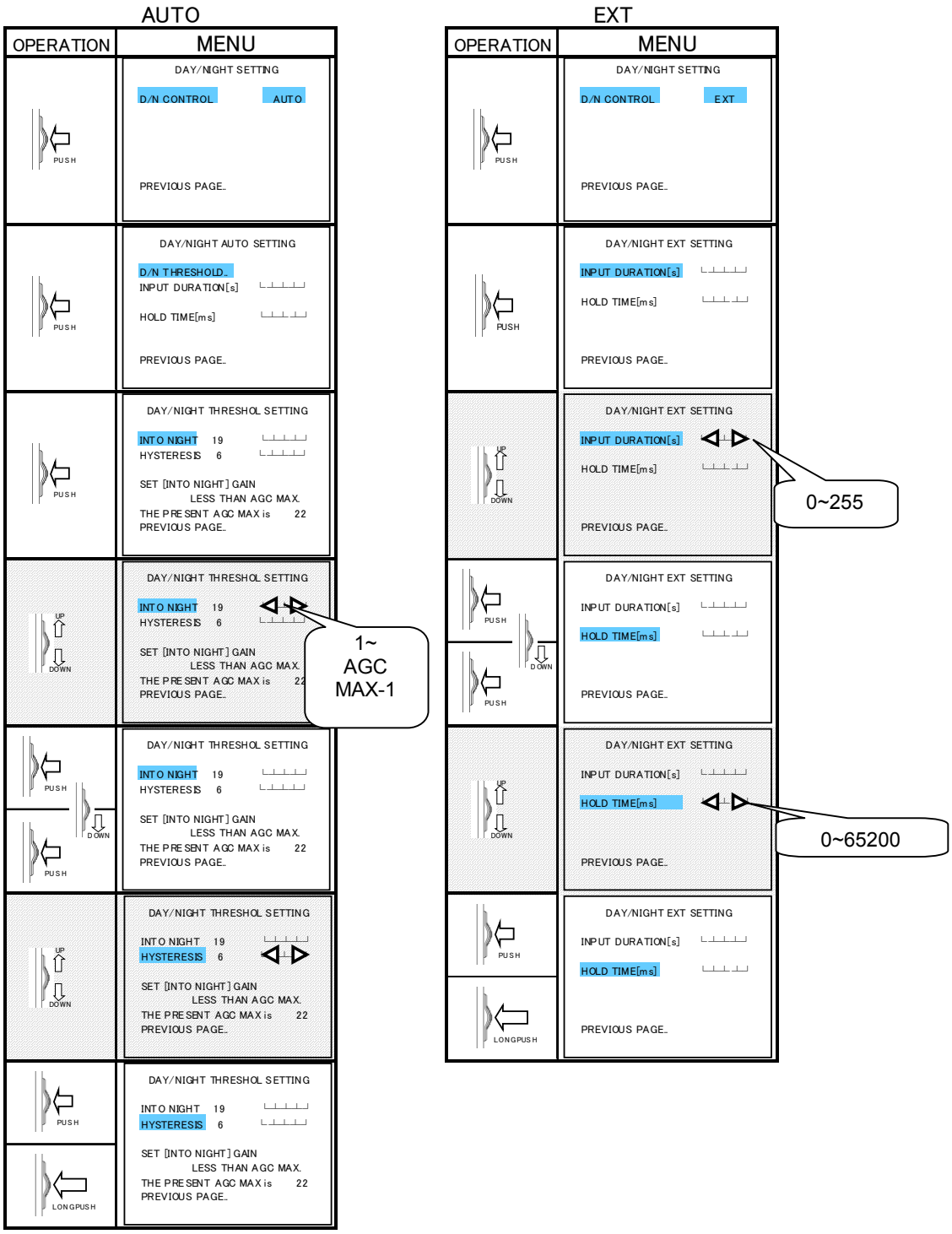


Chart 18. DURATION setting list

SETTING VALUE	DESCRIPTION	ADVANCED	EASY
INPUT DURATION[s]	Switch level duration	○	×
HOLD TIME[ms]	Hold time after switched	○	×

[Operation procedure]



3.4. Image Setting

3.4.1. Digital zoom

The WAT-1000 has a Digital Zoom/Pan/Tilt function. The required area on the monitor can be zoomed into. Automatic exposure control, dynamic range control and white balance mode are available within the zoom area assigned by digital zoom

The digital zoom is available when ON is selected in the ZOOM section. When OFF is selected, the digital zoom is not available. The default setting is OFF.

Chart 19. ZOOM mode setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
ZOOM	ON	Zoom is available	○	×
	OFF	Zoom is not available	○	×

When zoom mode is set to ON, push the center of the jog-dial, the following additional settings are available.

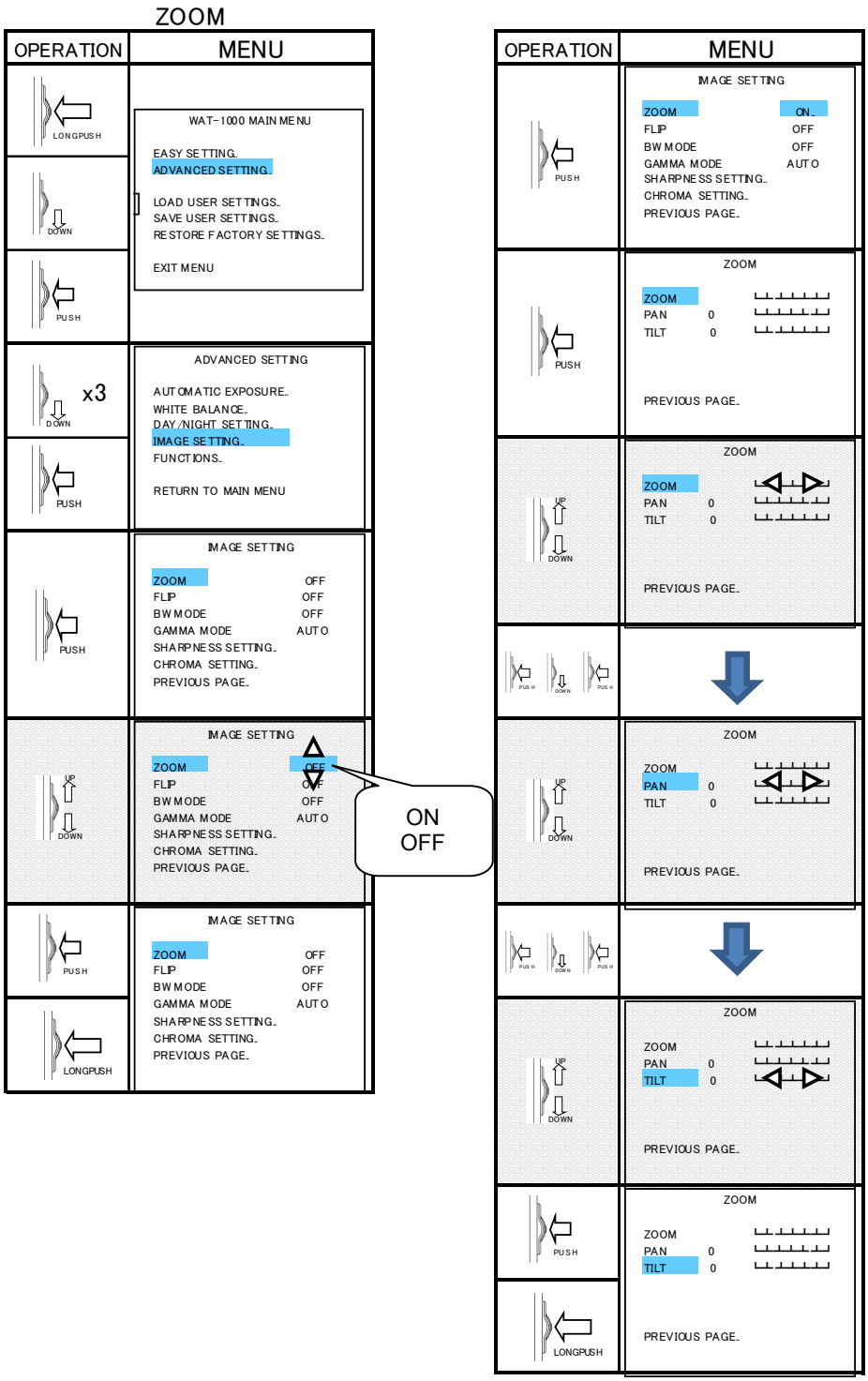
ZOOM：Setting the magnification percentage. An indicated value of the magnification ratio. (Max: 4)
P A N ：Setting Left/Right position. (Left: extremity: -100, Right extremity: 100)
T I L T：Setting Upper/Lower position. (Lower limit: -100, Upper limit: 100)

Chart 20. ZOOM setting list

SETTING VALUE	DESCRIPTION	ADVANCED	EASY
ZOOM	Magnification percentage	○	×
PAN	Left / Right	○	×
TILT	Upper / Lower	○	×

ZOOM mode is not available with ACTIVITY DETECTION mode.

[Operation procedure]



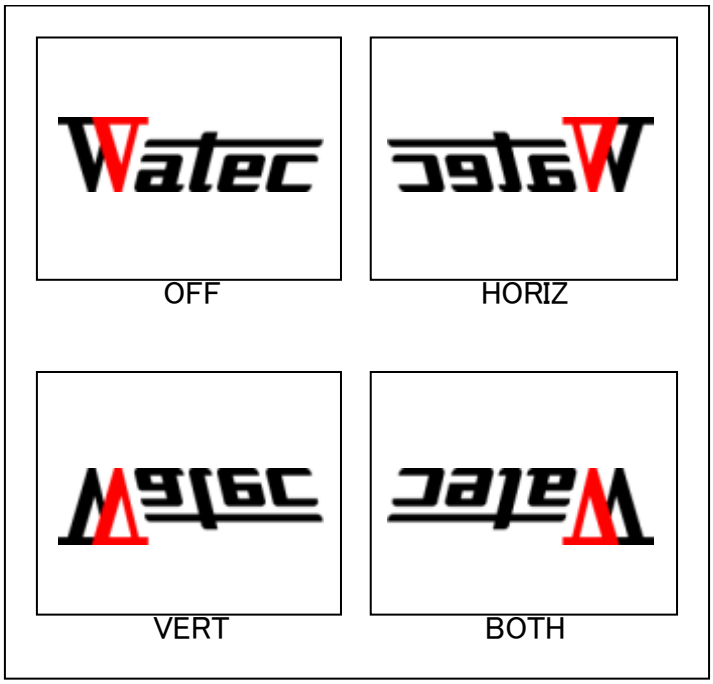
3.4.2. Flip

This mode is to flip an image horizontally and to flip an image vertically. It is used when using a back monitoring system for vehicles or to monitor a mirror image. Neither Camera ID nor OSD menu are inverted.

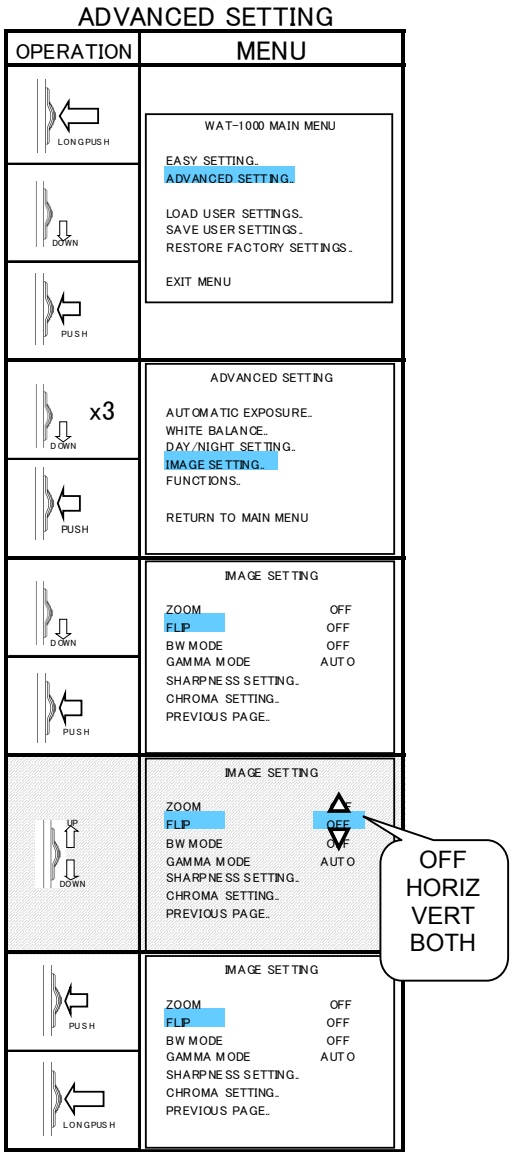
Chart 21. Flip mode setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
FLIP	OFF	Normal image	○	×
	HORIZ	Flip horizontal	○	×
	VERT	Flip vertical	○	×
	BOTH	Flip horizontal/vertical	○	×

Fig. 6 Flip image



[Operation procedure]



3.4.3. BW mode

This function is used to set the color output format of the video signal output mode. The default setting is OFF.

When OFF is selected, the BW mode output is color.

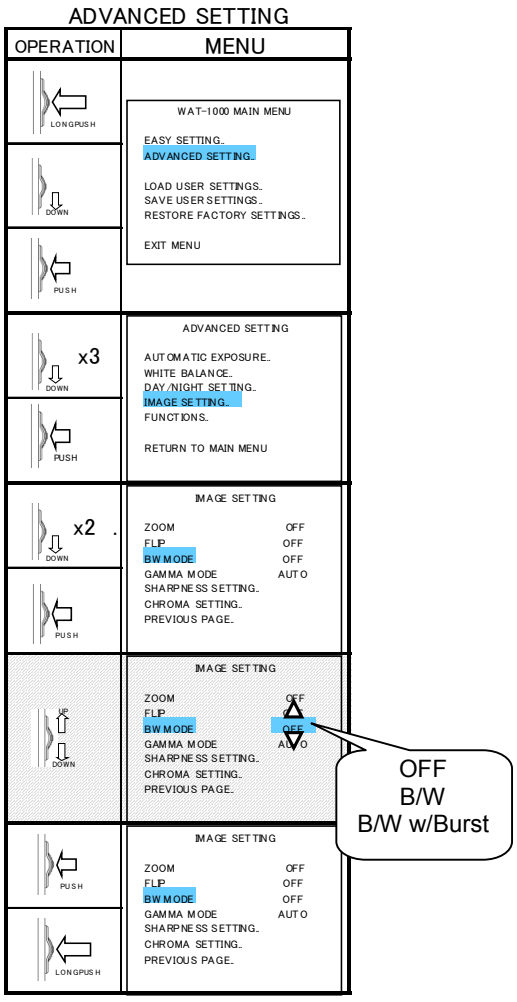
When B/W is selected, the BW mode output is monochrome.

When B/W w/Burst is selected, BW mode output is monochrome and the color burst signal is added. B/W w/Burst mode is used for a monitor which needs color burst to indicate an image.

Chart 22. BW mode setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
BW MODE	OFF	Color output	○	×
	B/W	Monochrome output	○	×
	B/W w/Burst	Monochrome output with burst	○	×

[Operation procedure]



3.4.4. Gamma correction

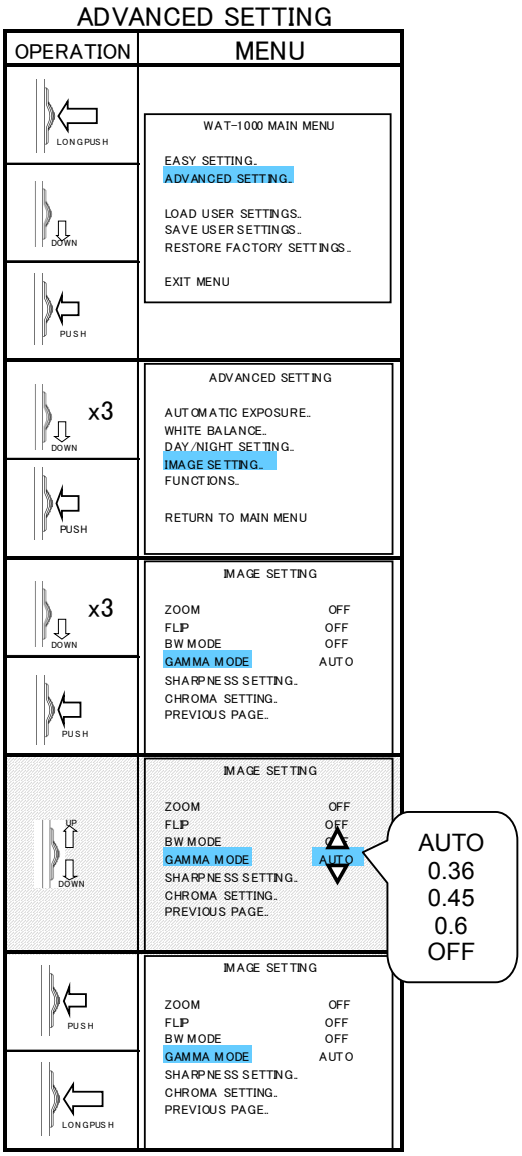
In general, the output of the CRT monitor and LCD monitor has nonlinearity against the input signal. Therefore, the correction of the characteristic opposite to the monitor is put on the output signal on the camera side beforehand so that the output by the monitor will become linear. This is called gamma correction. There are five kinds of gamma correction modes for the WAT-1000.

AUTO is the mode that automatically switches to 0.45 for PAL and 0.36 for NTSC according to the output format of the camera. Select this mode for normal usage.
0.36: The standard correction factor for PAL format
0.45: The standard correction factor for NTSC
0.6 : The correction factor which emphasizes the tone of the bright part of the standard setting
OFF: Linier output with no correction (For image processing use)

Chart 23. Gamma correction setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
GAMMA MODE	AUTO	0.36/0.45 (Automatic switch)	○	×
	0.36	PAL (Standard setting)	○	×
	0.45	NTSC (Standard setting)	○	×
	0.6	Emphasized bright area	○	×
	OFF	Linier output	○	×

[Operation procedure]



3.4.5. Sharpness

This function is used to correct the sharpness of the picture.

When DETAIL BOOST ON is selected, the edge enhancement processing is increased when an object has enough lighting. The image becomes sharp, but noise may increase around the dark part. When DETAIL BOOST OFF is selected, the edge enhancement mode is not available.

Chart 24. DETAIL BOOST setting list

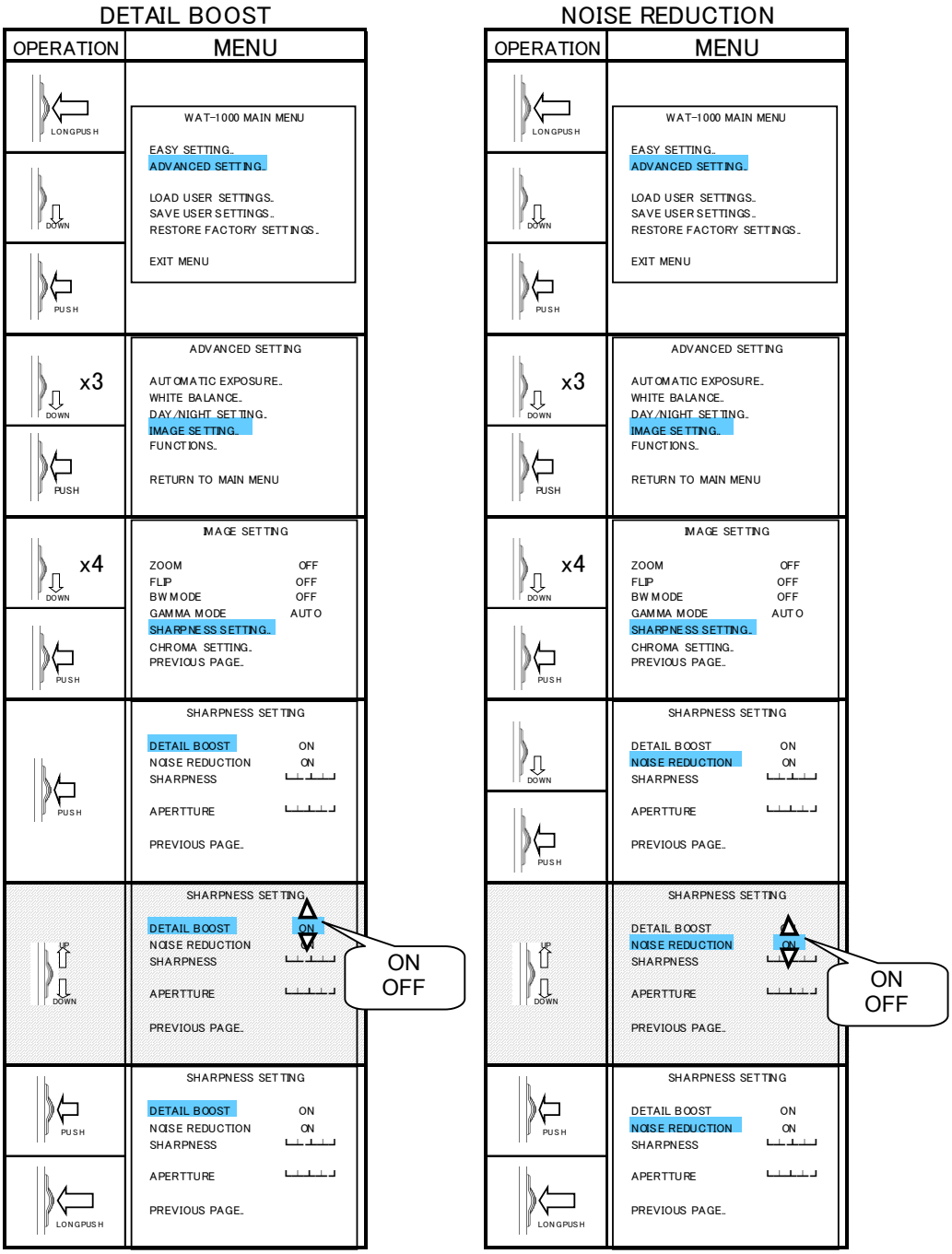
SETTING VALUE		DESCRIPTION	ADVANCED	EASY
DETAIL BOOST	ON	Edge enhancement is available in bright conditions	○	×
	OFF	Edge enhancement is not available	○	×

When NOISE REDUCTION ON is selected, noise is reduced and a soft image can be obtained. When OFF is selected, noise is visible, but a sharper image is obtained.

Chart 25. NOISE REDUCTION setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
NOISE REDUCTION	ON	The noise control ON	○	×
	OFF	The noise control OFF	○	×

[Operation procedure]



When the SHARPNESS setting value is raised, the level of edge enhancement of the whole screen goes up and becomes sharper, but noise is highly visible.

Chart 26. SHARPNESS setting list

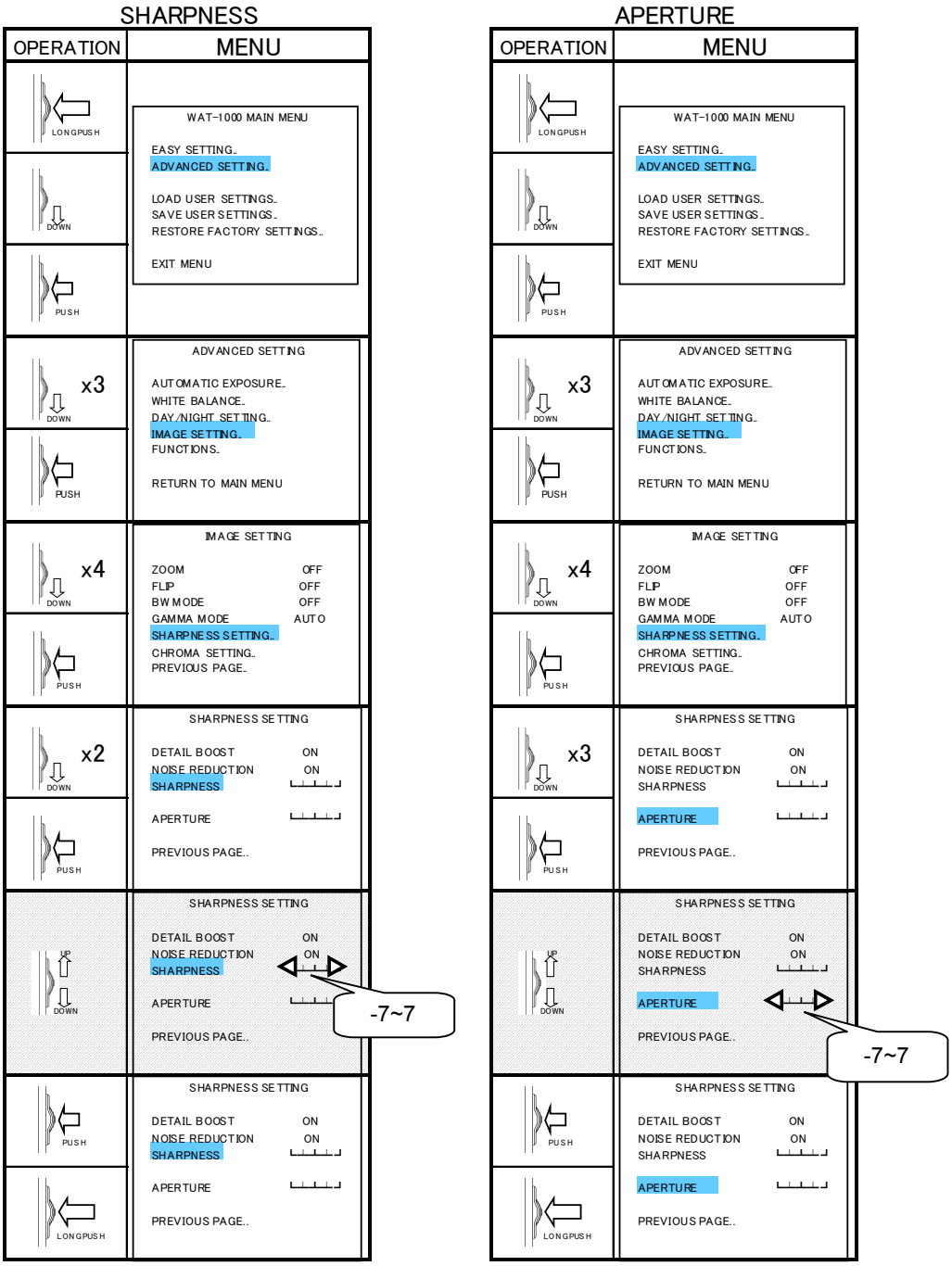
SETTING VALUE		DESCRIPTION	ADVANCED	EASY
SHARPNESS	-7～7	The level of edge enhancement on the whole screen	○	×

When the APRETURE setting value is raised, the level of the horizontal edge enhancement goes up and becomes a sharper image

Chart 27. APERTURE setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
APERTURE	-7～7	The level of horizontal edge object enhancement	○	×

[Operation procedure]



3.4.6. Chroma

CHROMA LEVEL is the parameter adjusting the vividness of the color of the video signal
When the chroma level is increased, the color of the video signal becomes more vivid.
The default setting is 0.

CHROMA LIMIT is the parameter for setting the maximum value of color saturation degree. When the setting value of the chroma limit is increase, it can reduce the color fade around high luminance in extreme backlight conditions. However, with a standard object, the color may change slightly in some areas due to the high luminance area on the screen.

Chart 28. Color setting list

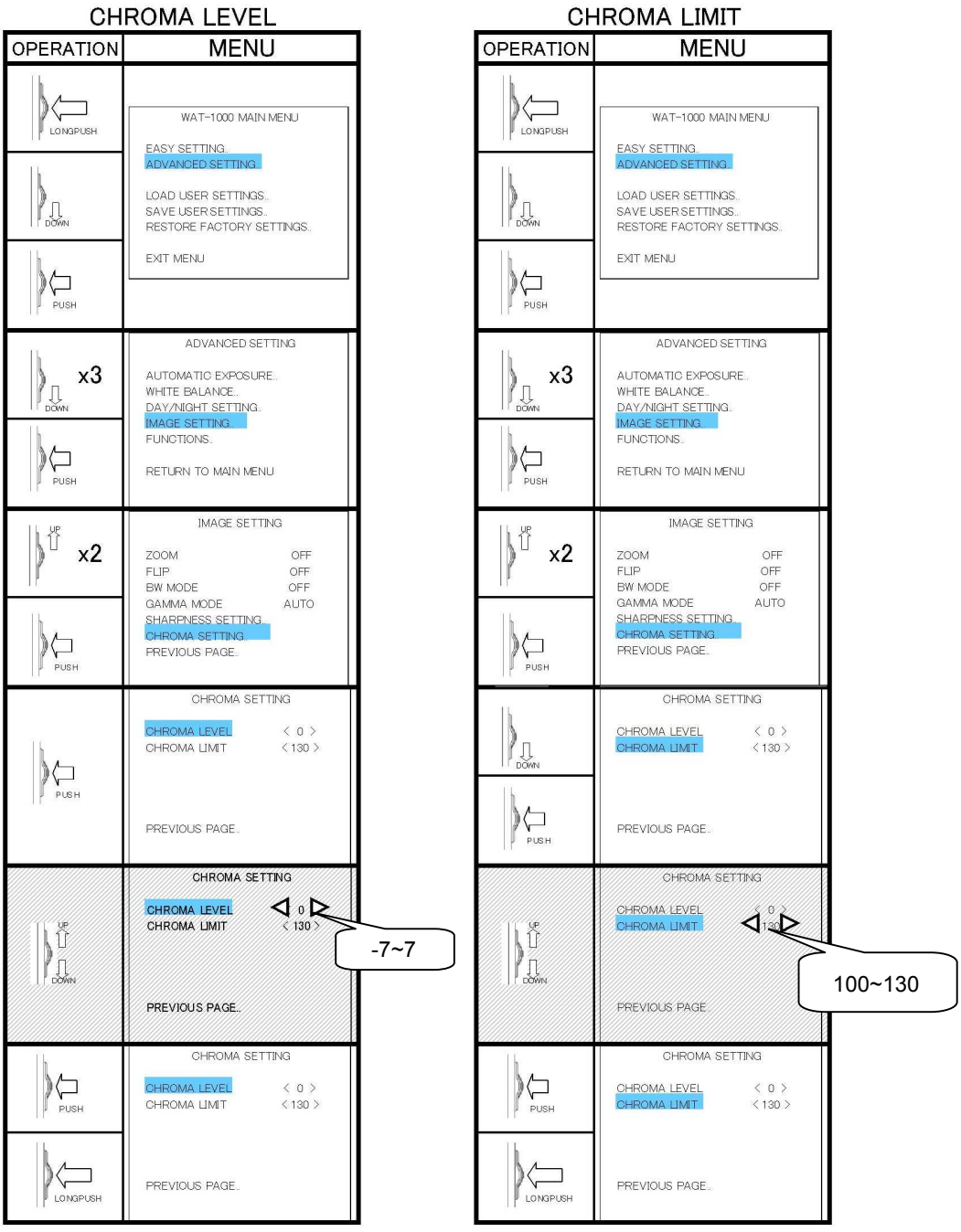
SETTING VALUE		DESCRIPTION	ADVANCED	EASY
CHOROMA LEVEL	-7～7	Setting the vividness of the color of the video signal	○	×
CHROMA LIMIT	100～130	Setting the color saturation degree	○	×

Fig. 7

CHROMA LIMIT：100

CHROMA LIMIT：130

[Operation procedure]

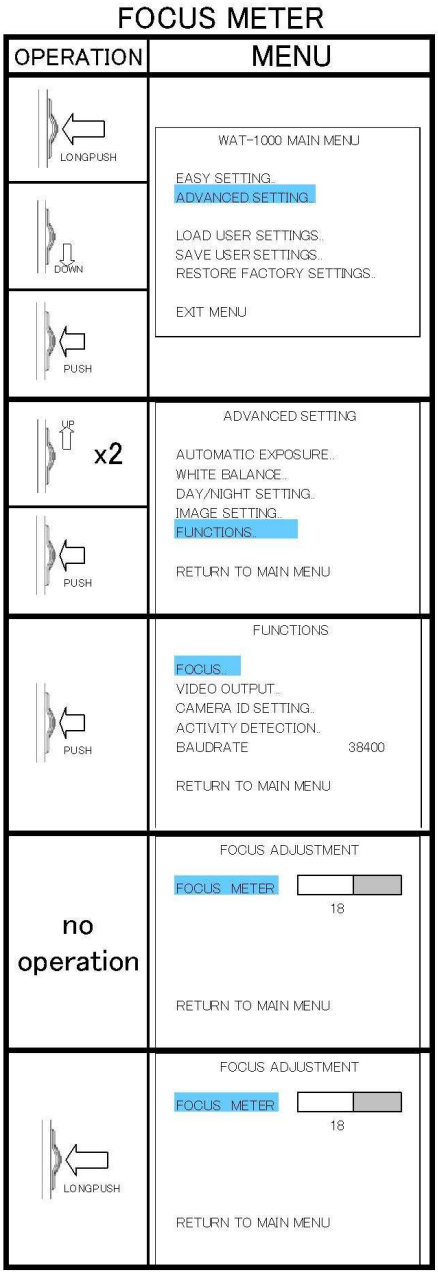


3.5. Functions

3.5.1. Focus adjustment

When the back focus and the focus of the lens is adjusted, the meter displays the focus condition. The large meter value of the focus display means a better focus. When the lighting conditions change, the meter value of the focus will also change. Therefore, please adjust the focus under stable lighting conditions if possible.

[Operation procedure]



3.5.2. Video output format

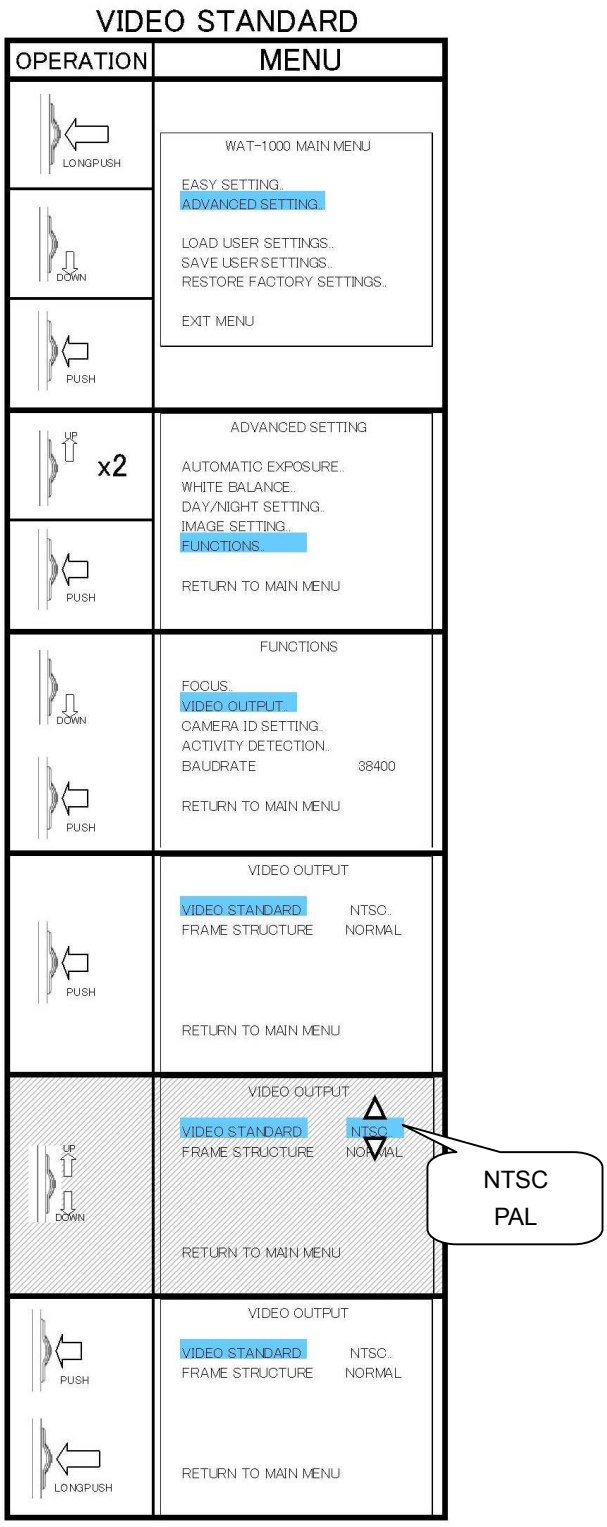
The WAT-1000 has a NTSC version and PAL version for convenience. However, the video output format can be selected using the “On Screen Display” menu.

VIDEO STANDARD is a parameter selecting the video output format. An NTSC version or a PAL version can be selected as needed. Set the same version as the target system.

Chart 29. VIDEO STANDARD setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
VIDEO STANDARD	NTSC	NTSC output	○	×
	PAL	PAL output	○	×

[Operation procedure]



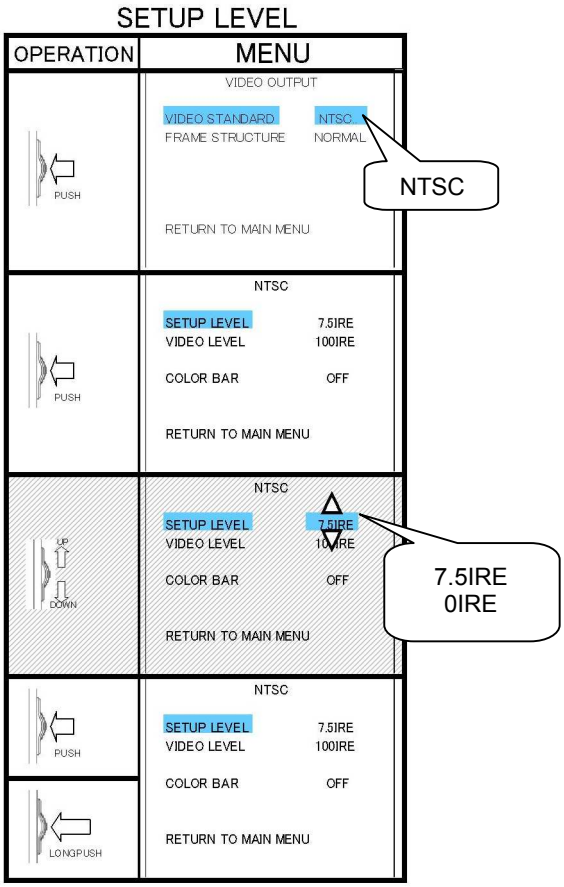
After the VIDEO STANDARD has been selected, push the center of the jog dial, which will you take you to the video output format list.

SETUP LEVEL is set to the reference level of black. This mode is only available with NTSC. 7.5IRE is equivalent of NTSC-M, which is mainly applied in US. For 0IRE, it is equivalent of NTSC-J, which is mainly applied in Japan. Select the SETUP LEVEL according to the specification of the target system. The default setting is 7.5IRE.

Chart 30. SETUP LEVEL setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
SETUP LEVEL	7.5IRE	NTSC-M worth	○	×
	0IRE	NTSC-J worth	○	×

[Operation procedure]

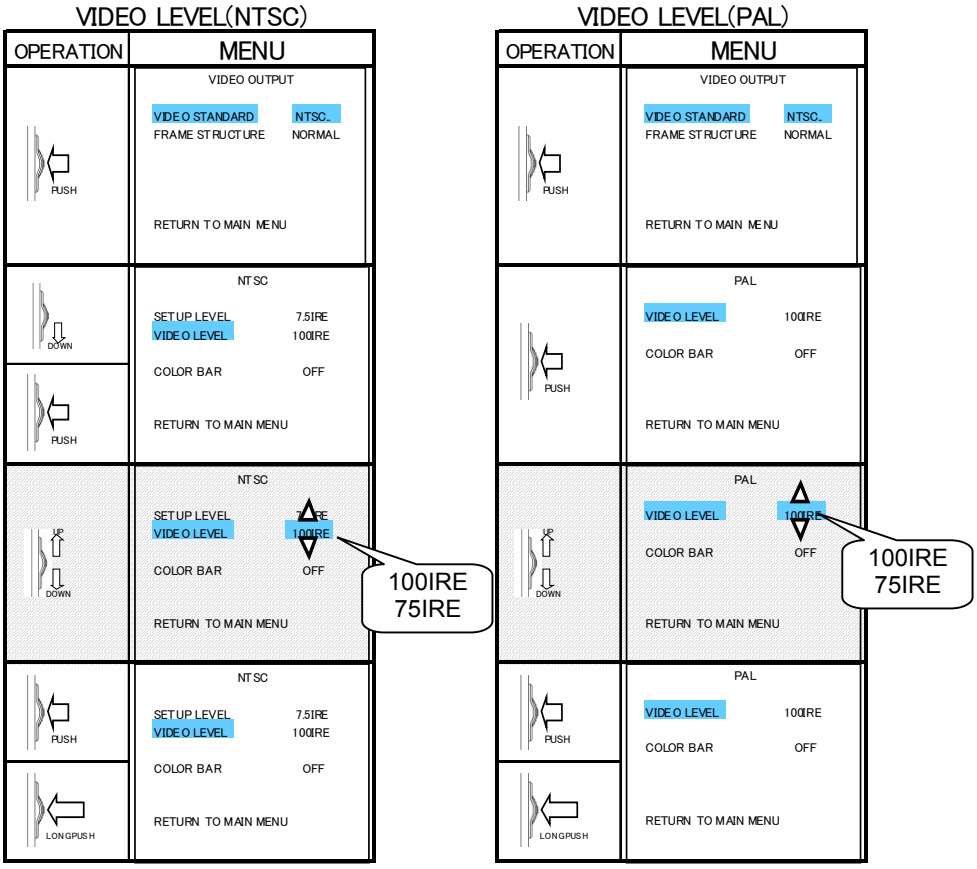


VIDEO LEVEL is set to a standard level of the video output. 75IRE is the standard video output level. For 100IRE, when it is selected, high contrast images can be seen, but over exposure may occur with bright parts depending on the connected devices. The default setting is 100IRE

Chart 31. VIDEO LEVEL setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
VIDEO LEVEL	75IRE	Normal output	○	×
	100IRE	High contrast output	○	×

[Operation procedure]

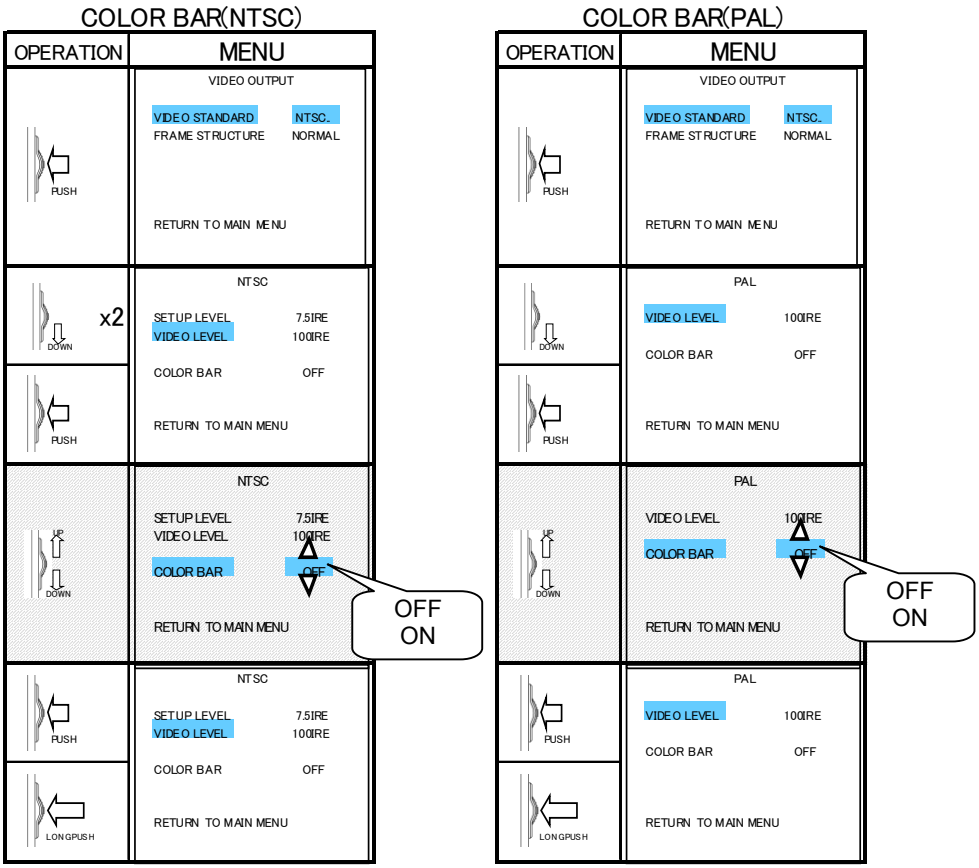


When the COLOR BAR ON is selected, the adjustment color bar signal is shown on the monitor. This mode is used when the brightness and the color of the monitor needs calibrating. The default setting is OFF.

Chart 32. COLOR BAR setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
COLOR BAR	OFF	Normal video output	○	×
	ON	Color bar output	○	×

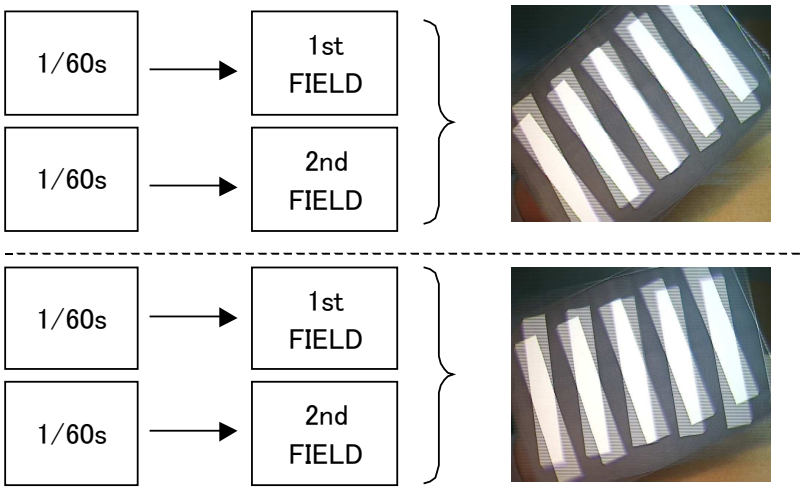
[Operation procedure]



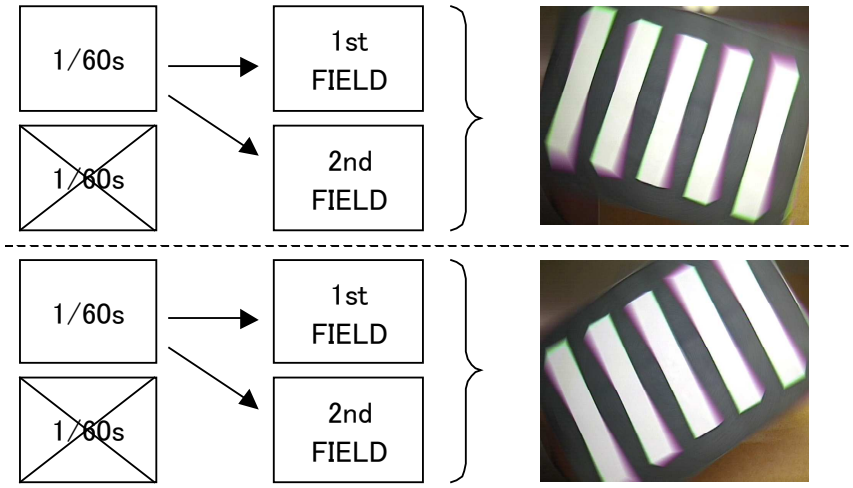
3.5.3. Frame structure

This function is set to the frame construction of the video output. The video signal of the NTSC/PAL format is an interlace format that composes of one frame per two fields of an even number line and an odd number line. In the WAT-1000, the method of generating two fields can be selected from three modes.

In the NORMAL mode, one field is generated from information exposed at 1/60 second. When capture is complete using a PC etc. because former information on the two fields that compose one frame is different, a gap (combing noise) between lines is generated.



In the PROGRESSIVE mode, two fields of the even number line and odd number lines are generated from information exposed at 1/60 second. The gap between lines does not occur at capture because the exposure timing of the two fields that composes one frame is the same. However, because the exposure becomes intermittent, the resolution of the moving object becomes decreased.



In the FREEZE mode, it generates the field the same as the PROGRESSIVE mode. However, it doesn't expose the second frame, the following frame is generated from the first exposure information.

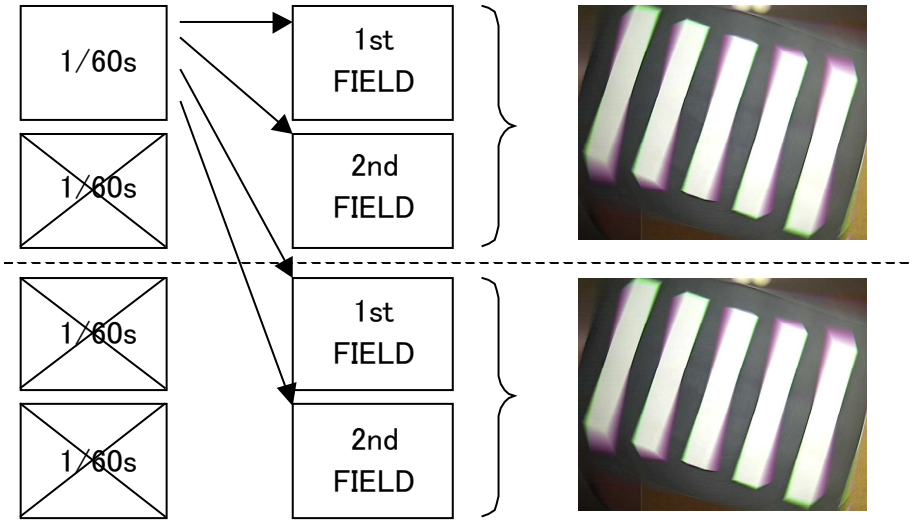
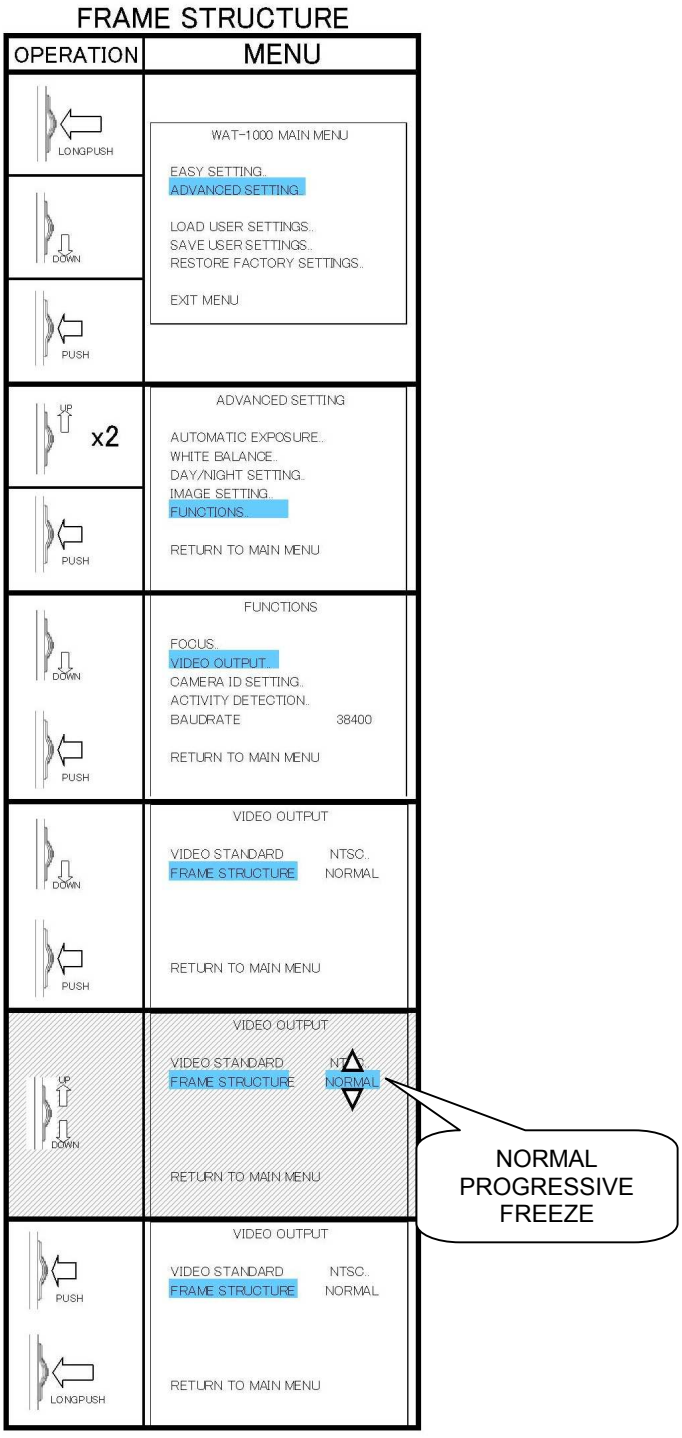


Chart 33. FRAME STRUCTURE setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
FRAME STRUCTURE	NORMAL	Normal output	○	×
	PROGRESSIVE	Progressive output	○	×
	FREEZE	Still image output	○	×

[Operating procedure]



3.5.4. Camera ID

CAMERA ID function is to display the arbitrary characters on the screen. When several cameras are used with different parameter settings, it is effective to identify a camera on the screen.

ID DISPLAY is set to ON/OFF for the camera ID. ON is for the display, and OFF is for nondisplay.

Chart 34. ID DISPLAY setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
ID DISPLAY	ON	Camera ID display	○	×
	OFF	Camera ID nondisplay	○	×

The CAMERA ID can use various characters for the camera ID. The available character numbers are up to 8 characters for the camera ID, and the available characters are alphabet (capital letters), numerals and symbols (“ “, ”+”, ”-”, ”_”, ”&”, ”#”, ”@”). The operation method of the CAMERA ID setting is a little different to the basic operation; therefore, please refer to the operation procedure as shown on the next page.

Chart 35. CAMERA ID setting list

SETTING VALUE	DESCRIPTION	ADVANCED	EASY
CAMERA ID	The setting for character string of the camera ID	○	×

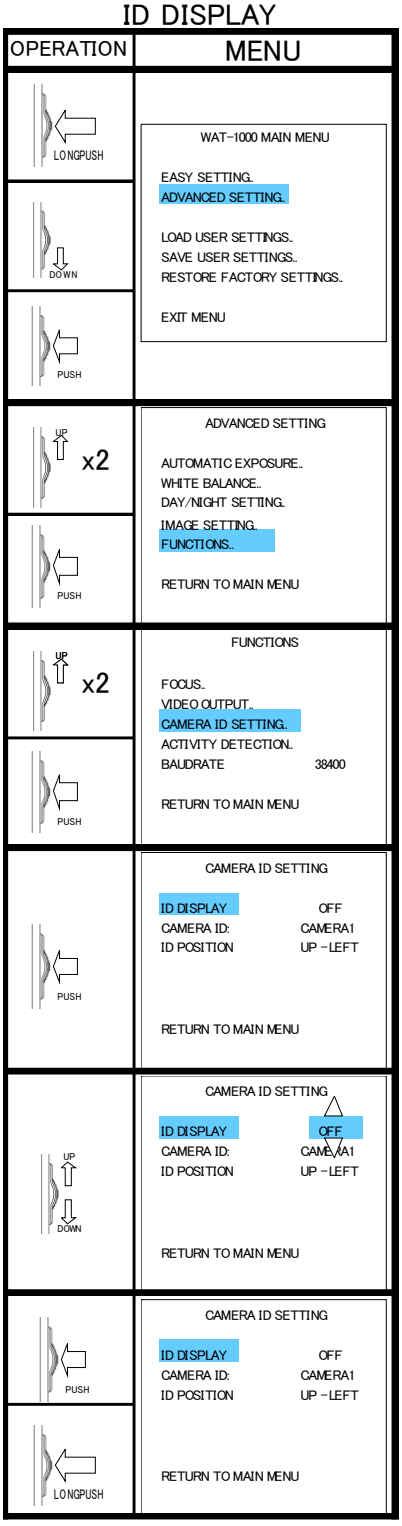
ID POSITION is to set the display position of camera ID on the OSD.

Chart 36. ID POSITION setting list

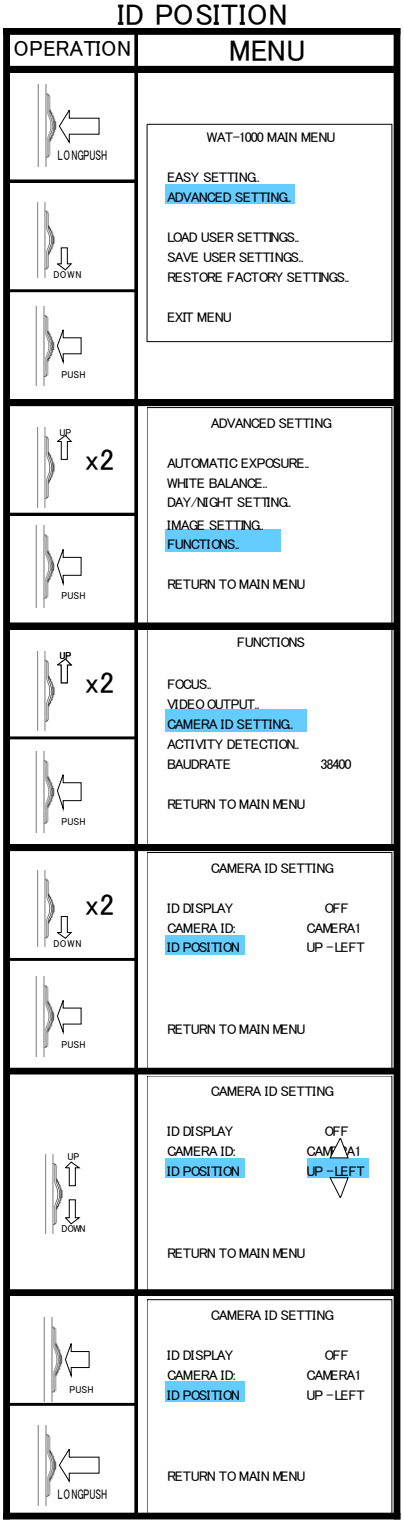
SETTING VALUE		DESCRIPTION	ADVANCED	EASY
ID POSITION	UP-LEFT	Upper left portion of the screen	○	×
	UP-CENTER	Upper center of the screen	○	×
	UP-RIGHT	Upper right portion of the screen	○	×
	DOWN-LEFT	Lower left portion of the screen	○	×
	DOWN-RIGHT	Lower right of the screen	○	×

[Operation procedure]

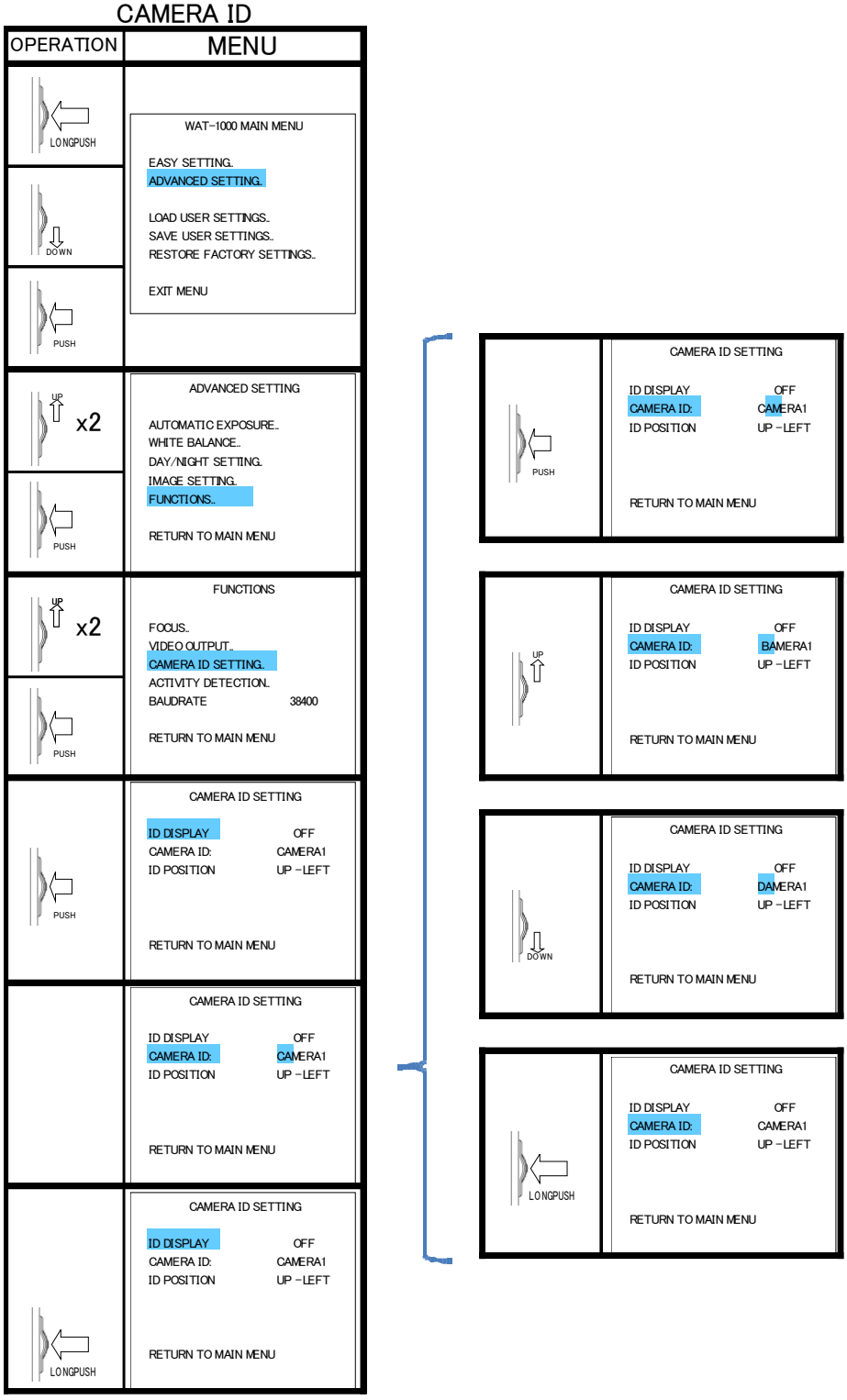
ID DISPLAY



ID POSITION



CAMERA ID


OPERATION
MENU
LONGPUSH
DOWN
PUSH
WAT-1000 MAIN MENU
EASY SETTING..
ADVANCED SETTING..
LOAD USER SETTINGS..
SAVE USER SETTINGS..
RESTORE FACTORY SETTINGS..
EXIT MENU
UP
x2
PUSH
ADVANCED SETTING
AUTOMATIC EXPOSURE..
WHITE BALANCE..
DAY/NIGHT SETTING..
IMAGE SETTING..
FUNCTIONS..
RETURN TO MAIN MENU
FUNCTIONS
FOCUS..
VIDEO OUTPUT..
CAMERA ID SETTING..
ACTIVITY DETECTION..
BAUDRATE 38400
RETURN TO MAIN MENU
CAMERA ID SETTING
ID DISPLAY OFF
CAMERA ID: CAMERA1
ID POSITION UP-LEFT
RETURN TO MAIN MENU
CAMERA ID SETTING
ID DISPLAY OFF
CAMERA ID: CAMERA1
ID POSITION UP-LEFT
RETURN TO MAIN MENU
CAMERA ID SETTING
ID DISPLAY OFF
CAMERA ID: CAMERA1
ID POSITION UP-LEFT
RETURN TO MAIN MENU
CAMERA ID SETTING
ID DISPLAY OFF
CAMERA ID: CAMERA1
ID POSITION UP-LEFT
RETURN TO MAIN MENU
CAMERA ID SETTING
ID DISPLAY OFF
CAMERA ID: CAMERA1
ID POSITION UP-LEFT
RETURN TO MAIN MENU
CAMERA ID SETTING
ID DISPLAY OFF
CAMERA ID: CAMERA1
ID POSITION UP-LEFT
RETURN TO MAIN MENU
CAMERA ID SETTING
ID DISPLAY OFF
CAMERA ID: CAMERA1
ID POSITION UP-LEFT
RETURN TO MAIN MENU

3.5.5. Activity detection

This function outputs an alarm signal and operates the digital zoom when motion is detected.

When ACTIVITY DETECTION is ON, the motion detection is available. When OFF is selected, motion detection mode is not available.

Chart 37. ACTIVITY DETECTION setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
ACTIVITY DETECTION	ON	The motion detection is available	○	×
	OFF	The motion detection is not available	○	×

When FULL SCREEN is selected, motion on the full screen is detected. When CUSTOM is selected, the area where motion is detected can be specified.

Chart 38. DETECTION ZONE setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
DETECTION ZONE	FULLSCREEN	The detection area is set to full screen.	○	×
	CUSTOM	The detection area can be specified	○	×

RESPONSE ZOOM is the function that is to zoom to a required area when a moving body is detected. Specify the zoom ratio in DIG.ZOOM, horizontal position in DIG.PAN and vertical position in DIG.TILT. The zoom ratio can be set up to X4. When RESPONSE ZOOM is not needed, set DIG.ZOOM to 1 (left extremity)

Chart 39. RESPONSE ZOOM setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
DIG.ZOOM	X1 ~ X4	The settings for zoom ratio	○	×
DIG.PAN	-100 ~ 100	The settings for horizontal position	○	×
DIG.TILT	-100 ~ 100	The settings for vertical position	○	×

THRESHOLD & DURATION is used to set the duration of the sensitivity of the motion detection and alarm signal.

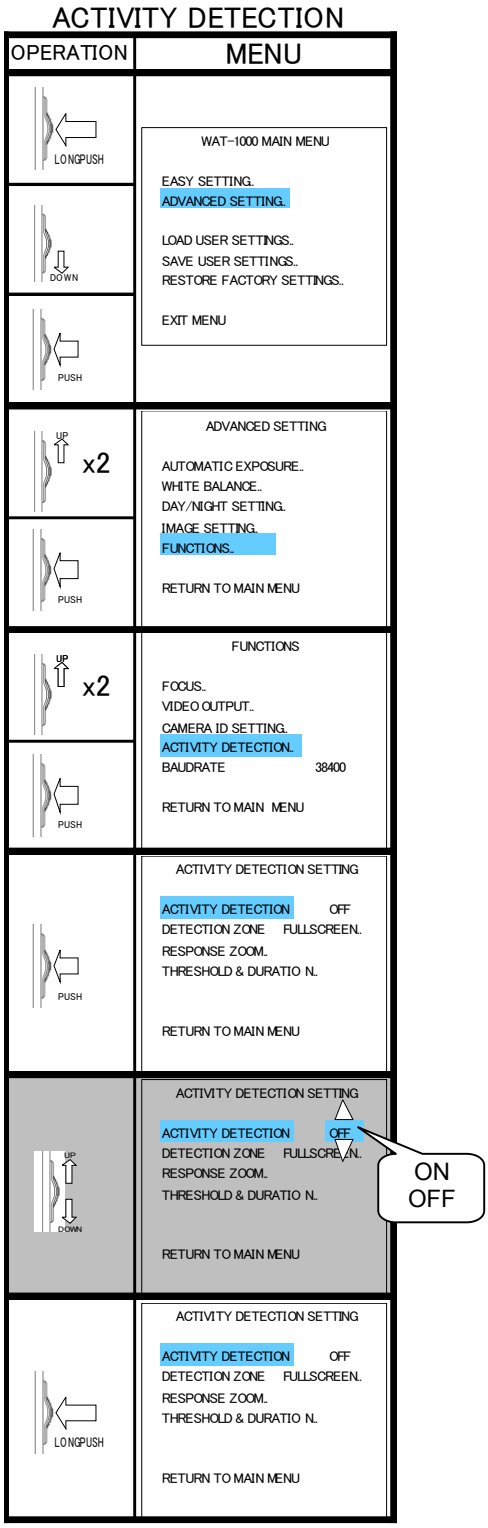
ACTIVITY THR is used to set the sensitivity of the motion detection. The sensitivity become high when the set value is low, and it can detect a moving body with a slight change. The default setting is 25.

The DURATION sets the operation period of the alarm signal output and the digital zoom after the motion detection. The default setting is 5 seconds. (Unit: second)

Chart 40. Motion detection setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
ACTIVITY THR.	0 ~ 255	The sensitivity setting of detection	○	
DURATION	3 ~ 60	Alarm output period[s]	○	

[Operation procedure]



DETECTION ZONE : FULLSCREEN

OPERATION	MENU
PUSH	ACTIVITY DETECTION SETTING ACTIVITY DETECTION OFF DETECTION ZONE FULLSCREEN. RESPONSE ZOOM. THRESHOLD & DURATIO N. RETURN TO MAIN MENU
LONGPUSH	ACTIVITY DET ZONE
LONGPUSH	ACTIVITY DETECTION SETTING ACTIVITY DETECTION OFF DETECTION ZONE FULLSCREEN. RESPONSE ZOOM. THRESHOLD & DURATIO N. RETURN TO MAIN MENU

DETECTION ZONE : CUSTOM

OPERATION	MENU
PUSH	ACTIVITY DETECTION SETTING ACTIVITY DETECTION OFF DETECTION ZONE CUSTOM. RESPONSE ZOOM. THRESHOLD & DURATIO N. RETURN TO MAIN MENU
※	CUSTOM DETECTION ZONE
LONGPUSH	ACTIVITY DETECTION SETTING ACTIVITY DETECTION OFF DETECTION ZONE CUSTOM. RESPONSE ZOOM. THRESHOLD & DURATIO N. RETURN TO MAIN MENU

OPERATION	MENU
UP DOWN	CUSTOM DETECTION ZONE
PUSH	
UP DOWN	CUSTOM DETECTION ZONE
PUSH	
UP DOWN	CUSTOM DETECTION ZONE
PUSH	
UP DOWN	CUSTOM DETECTION ZONE
LONGPUSH	ACTIVITY DETECTION SETTING ACTIVITY DETECTION OFF DETECTION ZONE CUSTOM. RESPONSE ZOOM. THRESHOLD & DURATION. RETURN TO MAIN MENU

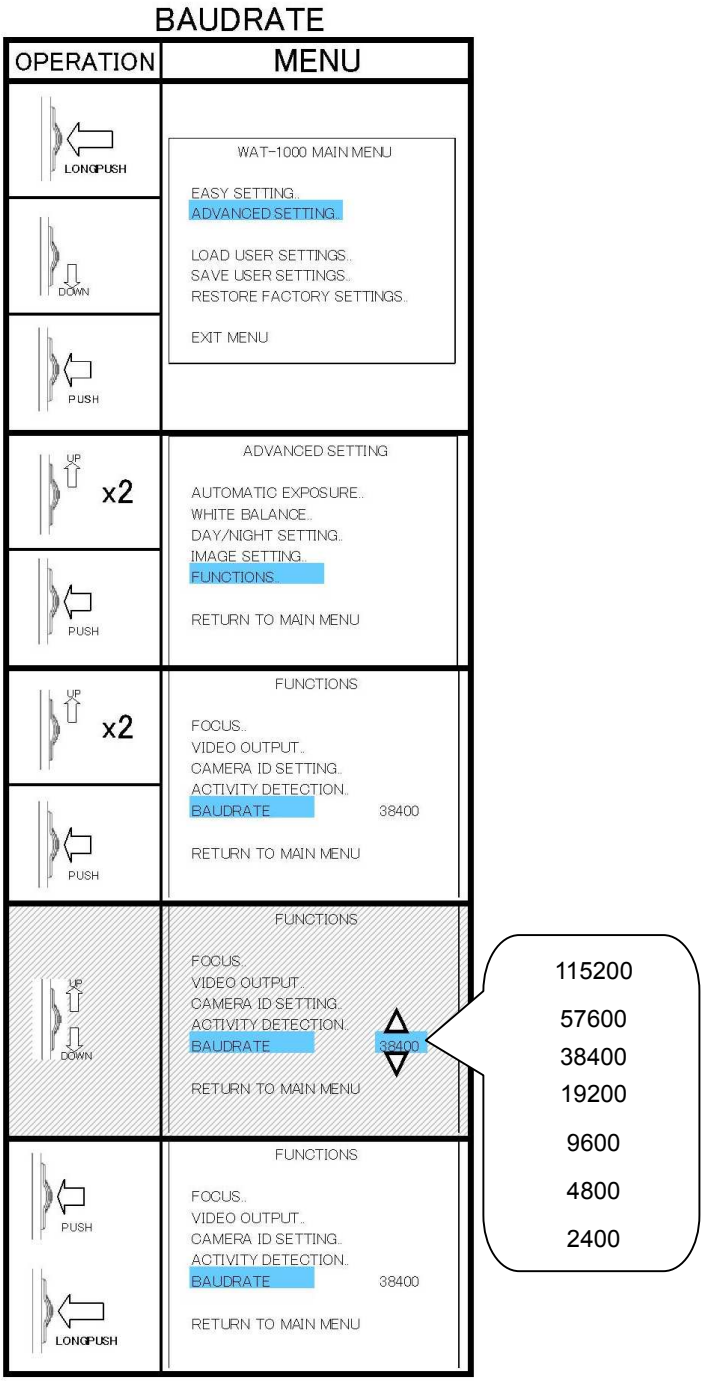
3.5.6. Baudrate

This function is used to set the communication speed of the serial communication (Unit: bps). Set the BAUDRATE according to the host side.

Chart 41. Communication speed setting list

SETTING VALUE		DESCRIPTION	ADVANCED	EASY
BAUD RATE	115200	115,200bps	○	×
	57600	57,600bps	○	×
	38400	38,400bps	○	×
	19200	19,200bps	○	×
	9600	9,600bps	○	×
	4800	4,800bps	○	×
	2400	2,400bps	○	×

[Operation procedure]



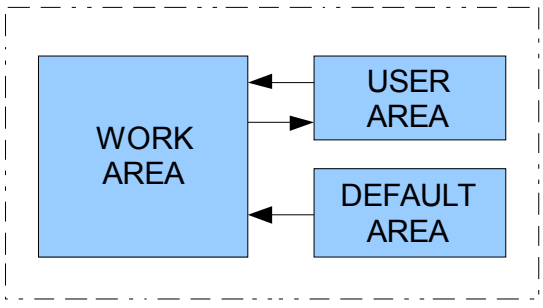
4. Saving, Loading and Restoring

There are three areas in the WAT-1000, which are called the “work area”, the “user area” and the “default area”. The explanation of each area is as follows.

For the work area, this is the setting parameter that is running at the present and has been changed. This area is synchronized with the OSD menu, therefore, when the parameter setting on the OSD menu changes, the parameters in the work area will also change. If the work area parameter is changed but not saved and the camera is turned off the settings will be lost and the camera, when turned on again will return to the parameter set before.

For the user area, this is the area to save a setting parameter of the work area. The setting saved to the user area is retrieved to the work area at the time of startup. Also, a setting of the user area can be retrieved using the OSD menu at times other than startup. The factory setting, the default parameter is saved to the user area.

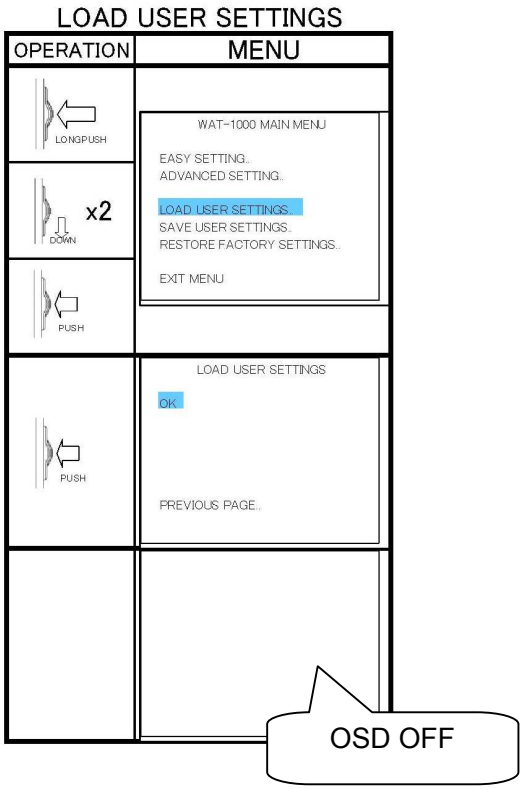
The default area, this is the area where the factory setting is saved. The factory setting can be retrieved to the work area by using the OSD menu. The default area is a read-only setting.



4.1. Loading a saved setting parameter

Retrieve the saved setting parameter in the user area to work area.
Then, the work area is updated, and the retrieved setting is installed into the camera.

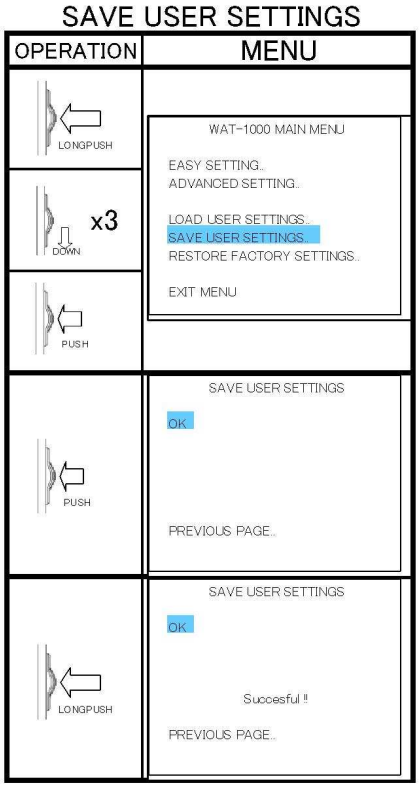
[Operation procedure]



4.2. Saving a setting parameter

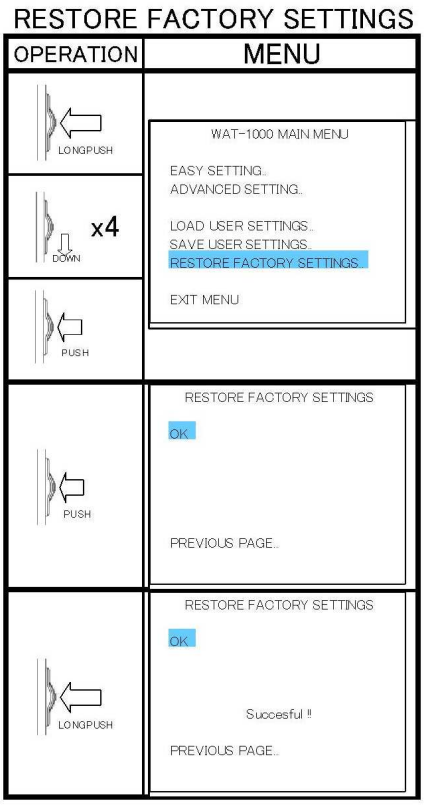
Save a current work area setting to the user area.

[Operation procedure]



4.3. Restoring the factory default settings

Retrieve the factory setting to the work area. The work area will be updated and the retrieved setting will be shown on the OSD.

If the user area also needs to be restored to the factory settings, operate same as the previous page.

[Operation procedure]